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SECTION

ENGINEERING DEPARTMENT.

THIRTY-SECOND ANNUAL REPORT

OF THE

Compliments of

William Jackson,

City Engineer.



BOSTON:
MUNICIPAL PRINTING OFFICE.
1899.

ENGINEERING DEPARTMENT.

THIRTY-SECOND ANNUAL REPORT

OF THE

CITY ENGINEER,

BOSTON,

FOR THE YEAR 1898.

Printed for the Department.



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Messrs. Stone & Webster,
Dec. 26, 1901.
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CITY OF BOSTON

ENGINEERING DEPARTMENT, CITY HALL,
BOSTON, February 1, 1899.

HON. JOSIAH QUINCY,

Mayor of the City of Boston:

SIR, — The following report of the expenses and operation of this department for the year ending January 31, 1899, is submitted:

The duties of the City Engineer include the designing and superintending of the construction of new bridges, retaining-walls, city wharves, and such other public engineering works as the City Council may authorize; the making of such surveys, plans, estimates, statements and descriptions, and taking such levels as the city government or any of its departments or committees may require; the custody of all surveys and plans relating to the laying-out, locating anew, altering, widening or discontinuing of streets; and the new engineering construction for all departments of the city. He must be consulted on all work where the advice of a civil engineer would be of service. The office of the City Engineer was established by ordinance on October 31, 1850, and by chapter 449 of the Acts of 1895.

The Architectural Division of the Public Buildings Department was detached from that department January 13, 1898, and placed under the Engineering Department. The work of this division is that of a consulting or expert force. It may be called upon by any department for technical advice on matters relating to building, heating or ventilation. Plans or specifications for work to be done, in certain cases, by the Repair

Division of the Public Buildings Department, are prepared by this division, which is also charged with a general supervision of the work done by the Repair Division of the Public Buildings Department.

The following is a statement of engineering expenses from February 1, 1898, to January 31, 1899:

Amount of department appropriation for 1898–1899	$75,000 00
Revenue	11 25
Transferred from surplus revenue	4,829 60
Amount expended for 1898–99	$79,840 85

STATEMENT OF EXPENDITURES, DEPARTMENT APPROPRIATION.

Object of expenditures:		
Salaries:		
Engineer, William Jackson	$6,000 00	
Assistant Engineer, architect, draughtsmen and assistants	62,729 65	
		$68,729 65
Instruments, tools and repairs		1,975 46
Travelling expenses		1,697 70
Furniture and office expenses		1,326 72
Stationery and drawing materials		1,251 49
Printing		788 87
Horse-keeping		774 30
Blue printing and photographing		565 49
Binding and plans		344 21
Books and papers		273 85
Telephone service		224 15
Washing and small supplies		216 86
Typewriting		41 00
Expenses on account of abolishment of grade crossings		1,631 10
		$79,840 85

ABOLISHMENT OF GRADE CROSSINGS.

Congress Street.

Expenditures from February 1, 1898, to January 31, 1899.

Items of expenditure:	
Summer-street abutment, piers, etc.	$147,166 28
Land damages	56,783 57
Congress street, sea-wall	21,110 48
Filling	15,161 03
Paving, fences, etc.	12,477 68
Engineering	7,826 97
Inspection	6,051 82
Draw foundation, fender piers, etc.	5,713 70
Dredging	2,245 00
Printing	416 76
Cement tests	325 00
Auditing	300 00
Rent of office	225 00
Advertising	247 42
Appraisal of land and buildings	100 00
	$276,150 71
Expended previous to 1898	66,532 50
	$342,683 21

Dorchester Avenue.

Items of expenditure:	
Land damages	$4,101 10
Engineering	1,722 17
Borings	399 68
Filling	104 50
Advertising	9 75
	$6,337 20

Dover Street.

No expenditures from February 1, 1898, to January 31, 1899.

Expended previous to 1898	$151,082 60

SOUTH UNION STATION.

Items of expenditure by the Engineering Department, from February 1, 1898, to January 31, 1899:

Contracts for sea-wall	$37,865 87
Federal-street bridge, widening Boston end,	10,319 09
Filling	4,016 90
Engineering	3,200 12
Inspection	1,975 73
Fence and sidewalks	592 09
Removing material	447 20
Printing	239 58
Advertising	101 70
Rent of office	75 00
Stationery	6 85
	$58,840 13
Expended previous to 1898	109,844 77
	$168,684 90

FANEUIL HALL BUILDING RECONSTRUCTION.

Appropriation		$80,000 00
Expenditures from August 1, 1898, to January 31, 1899:		
Woodbury & Leighton, foundations, etc.	$5,312 50	
Engineering	589 22	
Storage	290 00	
Soundings	127 21	
Printing	82 82	
		6,401 75
Balance, February 1, 1899		$73,598 25

BRIDGES.

The annual inspection of all highway and foot-bridges has been made, together with special examinations when notified by the Superintendent of Streets of the progress of repairs.

The management of all the bridges and draws between Cambridge and Boston, by the Acts of 1898, chapter 467, is vested in a board of two commissioners, which now has

charge of the following eight bridges, viz.: Canal, Harvard, Prison Point, West Boston, Cambridge street, Essex street, North Harvard street, and Western avenue to Cambridge; one-half the cost of the maintenance of these bridges is paid by each of these cities.

In the list of bridges those marked with a star (*) are over navigable waters, and are each provided with a draw, the openings in which are shown in a table in Appendix A. The widths of the openings have been measured for this report.

I. — BRIDGES WHOLLY SUPPORTED BY BOSTON.

Agassiz road, in The Fens.

Allston bridge, over Boston & Albany Railroad, Brighton.

Arborway bridge, in Parkway, over Stony brook.

Ashland street, over Providence Division, N. Y., N. H. & H. R.R., West Roxbury.

Athens street, over Midland Division, N. Y., N. H. & H. R.R.

Audubon road, over Boston & Albany Railroad.

Beacon street, over outlet to The Fens.

Beacon street, over Boston & Albany Railroad.

Berkeley street, over Boston & Albany Railroad.

Berkeley street, over Providence Division, N. Y., N. H. & H. R.R.

Bernier-street foot-bridge, in the Riverway.

Berwick-park foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.

Blakemore street, over Providence Division, N. Y., N. H. & H. R.R.

Bolton street, over Midland Division, N. Y., N. H. & H. R.R.

Boylston street, in The Fens.

Boylston street, over Boston & Albany Railroad.

Bridle path in the Riverway, over Muddy river.

*Broadway, over Fort Point channel.

Broadway, over Boston & Albany Railroad.

Brookline avenue, over Boston & Albany Railroad.

Byron street, over Boston, Revere Beach & Lynn Railroad.

*Castle Island foot-bridge, from Marine park, South Boston, to Castle Island.

*Charles-river bridge, from Boston to Charlestown.

Charlesgate, in The Fens, over Boston & Albany Railroad.

*Chelsea bridge, South, over South channel of Mystic river.
*Chelsea street, from East Boston to Chelsea.
Circuit drive, over Scarboro' pond in Franklin park.
Columbus avenue, over Boston & Albany Railroad.
*Commercial point, or Tenean, Dorchester.
Commonwealth avenue, in The Fens.
*Congress street, over Fort Point channel.
Cornwall street, over Stony brook, West Roxbury.
Cottage Farm bridge, over Boston & Albany Railroad, Brighton.
Cottage-street foot-bridge, over flats, East Boston.
Dartmouth street, over Boston & Albany Railroad and Providence Division, N. Y., N. H. & H. R.R.
*Dover street, over Fort Point channel.
Ellicott arch, in Franklin park.
*Federal street, over Fort Point channel.
Fen bridge, in The Fens.
Ferdinand street, over Boston & Albany Railroad.
Forest Hills entrance, in Franklin park.
Gold street, over Midland Division, N. Y., N. H. & H. R.R.
Huntington avenue, over Boston & Albany Railroad.
Ipswich street, over Waterway, in The Fens.
Irvington-street foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.
*L street, over Reserved channel, South Boston.
Leverett-pond foot-bridge, in Leverett park.
Leyden street, over Boston, Revere Beach & Lynn Railroad.
Linden Park street, over Stony brook.
*Malden bridge, from Charlestown to Everett.
Massachusetts avenue, over Boston & Albany Railroad.
Massachusetts avenue, over Providence Division, N. Y., N. H. & H. R.R.
*Meridian street, from East Boston to Chelsea.
*Mount Washington avenue, over Fort Point channel.
Neptune road, over Boston, Revere Beach & Lynn Railroad.
Newton street, over Providence Division, N. Y., N. H. & H. R.R.
Public Garden foot-bridge.
Scarboro'-pond foot-bridge in Franklin park.
Shawmut avenue, over Boston & Albany Railroad.
Stony brook, in The Fens.
Swett street, east of Midland Division, N. Y., N. H. & H. R.R.

Swett street, west of Midland Division, N. Y., N. H. & H. R.R.

*Warren bridge, Boston to Charlestown.

West Rutland-square foot-bridge, over Providence Division, N. Y., N. H. & H. R.R.

Winthrop, from Breed's Island to Winthrop.

II. — Bridges of which Boston Supports the Part within its Limits.

Bellevue street, in the Riverway, over Muddy river.

Bernier-street foot-bridge, in the Riverway, over Muddy river.

Brookline avenue, in the Riverway, over Muddy river.

Central avenue, from Dorchester to Milton.

*Chelsea bridge, North, over North Channel, Mystic river.

*Granite bridge, from Dorchester to Milton.

Longwood avenue, in the Riverway, over Muddy river and Boston & Albany Railroad.

Mattapan bridge, from Dorchester to Milton.

Milton bridge, from Dorchester to Milton.

*Neponset bridge, from Dorchester to Quincy.

*North Beacon street, from Brighton to Watertown.

Spring street, from West Roxbury to Dedham.

Tremont street, in the Riverway, over Muddy river.

*Western avenue, from Brighton to Watertown.

III. — Bridges of which Boston pays a Part of the Cost of Maintenance.

Albany street, over Boston & Albany Railroad.

Ashmont street and Dorchester avenue, over Old Colony Division, N. Y., N. H. & H. R.R.

*Canal bridge, from Boston to Cambridge.

*Cambridge street, from Brighton to Cambridge.

Chelsea bridge, over the Boston & Maine Railroad.

Dorchester street, over Old Colony Division, N. Y., N. H. & H. R.R.

*Essex street, from Brighton to Cambridge.

Everett street, over Boston & Albany Railroad, Brighton.

*Harvard bridge, from Boston to Cambridge.

Harvard street, over Midland Division, N. Y., N. H. & H. R.R., Dorchester.

*North Harvard street, from Brighton to Cambridge.

*Prison-Point bridge, Charlestown to Cambridge.

*West Boston bridge, from Boston to Cambridge.

West Fourth street, over Old Colony Division, N. Y., N. H. & H. R.R.
*Western avenue, from Brighton to Cambridge.

IV. — Bridges Supported by Railroad Corporations.

1st. — Boston & Albany R.R.

Harrison avenue.
Market street, Brighton.
Tremont street.
Washington street.

2d. — Boston & Maine R.R., Western Division.

Main street.
Mystic avenue.

3d. — Boston & Maine R.R., Eastern Division.

Main street.
Mystic avenue.

4th. — Boston, Revere Beach & Lynn R.R.

Everett street.

5th. — New England R.R.; New York, New Haven & Hartford R.R., Midland Division.

Broadway.
Dorchester avenue.
Fifth street.
Fourth street.
Morton street, Dorchester.
Norfolk street, Dorchester.
Norfolk street, Dorchester.
Second street.
Silver street.
Sixth street.
Third street.
Washington street, Dorchester.

6th. — New York, New Haven & Hartford R.R., Old Colony Division.

Adams street.
Cedar Grove Cemetery.
Freeport street.
Savin Hill avenue.

7th. — New York, New Haven & Hartford R.R., Providence Division.

Beech street, West Roxbury.
Bellevue street, West Roxbury.
Canterbury street, West Roxbury.
Centre and Mt. Vernon streets.
Dudley avenue.
Park street.

Recapitulation of Bridges.

I.	Number wholly supported by Boston	65
II.	Number of which Boston supports that part within its limits	14
III.	Number of which Boston pays a part of the cost of maintenance	15
IV.	Number supported by railroad corporations:	
1.	Boston & Albany	4
2.	Boston & Maine, Western Division	2
3.	Boston & Maine, Eastern Division	2
4.	Boston, Revere Beach & Lynn Railroad	1
5.	New England Railroad, N. Y., N. H. & H. R.R., Midland Division	12
6.	N. Y., N. H. & H. R.R., Old Colony Division	4
7.	N. Y., N. H. & H. R.R., Providence Division	6
	Total	125

Agassiz-road Bridge (in the Fens).

This bridge was built in 1887, of brick and stone masonry. It is maintained by the Park Department, and is in good condition.

Albany-street Bridge (over the Boston & Albany R.R.).

The original structure was built in 1856–57, and rebuilt in 1867–68. The present bridge was built in 1886–87, and is maintained in part by the City of Boston, and in part by the Boston & Albany Railroad. Attention was called last year to the rusty condition of the under side of the floor beams and of the fence; also to the condition of the sidewalk planking. Nothing has been done to change these conditions during the last year. They should be attended to this year.

Allston Bridge (over the Boston & Albany R.R., Brighton).

This is an iron bridge, built in 1892. The fences and the ironwork below the flooring should be cleaned and painted as recommended in last year's report.

Arborway Bridge (over Stony brook, in Parkway, near Forest Hills Station).

This is a wooden bridge resting on abutments of vulcanized spruce piles. The stringers and under-planking are of vulcanized hard pine. It was built in 1893, and is maintained by the Park Department. The bridge has been sheathed during the year, and is now in good condition.

Ashland-street Bridge (over Providence Division, New York, New Haven & Hartford R.R., West Roxbury).

The present structure is of iron, and was built in 1875. The fence on the southerly side has been rebuilt during the year, and the bridge is now in good condition.

Athens-street Bridge (over New England Railroad; Midland Division, New York, New Haven & Hartford R.R.).

This is an iron bridge, built in 1874. The bridge is in poor condition; it should be stripped and painted, and the upper woodwork should be renewed.

Audubon-road Bridge (over the Boston & Albany R.R.).

This is a steel-plate girder bridge, built in 1893–94, and is now in good condition. It is maintained by the Park Department.

Beacon-street Bridge (over Outlet of the Fens).

This is an iron bridge, built in 1880–81. The deck is in poor condition, and should be renewed, and the sidewalks should be replanked.

Beacon-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1884–85, widened in 1887–88, and the central roadway further widened in 1890 for the convenience and at the expense of the Street Railway Company. The ironwork below the floor of the westerly roadway has been cleaned and painted, and new lower planking has been put in. The bridge is now in good condition.

Bellevue-street Bridge (over Muddy River, in Riverway).

This is a segmental masonry arch of 44 feet span and 15 feet rise. It was built in 1893 by the Park Departments of Boston and Brookline, and is maintained jointly by them.

Berkeley-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1891, and is now in good condition. The roadways of this bridge have been closed during a portion of the past year to enable a second span to be built over the new tracks leading to the South Station. Work is still in progress, and will be completed early this year.

Berkeley-street Bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This bridge has been reported for a number of years to be in a poor condition, and only such repairs as seemed absolutely necessary to keep the bridge in a safe condition for travel, have been made. The removal of the railroad tracks under the bridge during the coming year will, it is hoped, render it unnecessary to maintain this bridge for a much longer time.

Bernier-street Foot-bridge (over Bridle Path in Riverway).

This is a semi-circular masonry arch of 38 feet 4 inches span. It was built in 1893, and is maintained by the Park Department.

Bernier-street Foot-bridge (over Muddy River).

This is a segmental masonry arch of 52 feet span and 14 feet rise. It was built in 1893 by the Park Departments of Boston and Brookline, and is maintained jointly by them.

Berwick-park Foot-bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This is an iron foot-bridge, erected in 1894. The iron stairs and piers were new, but the trusses and floor-beams were those built for Franklin street in 1883. It is now in good condition.

Blakemore-street Bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This is an iron bridge, built in 1881–82. As recommended last year it should be painted and the under-planking renewed.

Bolton-street Bridge (over New England Railroad; Midland Division, New York, New Haven & Hartford R.R.).

This is a wooden bridge, built in 1889. The fences should be repaired and painted; otherwise the bridge is in good condition.

Boylston-street Arch Bridge (in the Fens).

This is a stone arch bridge, built in 1881. It is in good condition.

Boylston-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1886–88. The ironwork below the floor of the bridge, although painted in 1895, is now very rusty. The sidewalk planking is very thin and should be renewed, and the facias should be repaired.

Bridle-path Bridge (over Muddy River, in the Riverway).

This is a masonry bridge of three arches; the central arch is elliptical in form, with a span of 30 feet and a rise of 9 feet 6 inches; the side-arches are semi-circular, 15 feet in diameter. It was built in 1894, and is maintained by the Park Department. It is in good condition.

Broadway Bridge (over Fort Point Channel).

This is an iron bridge. It was built in 1869–71, and the draw and its foundation were rebuilt in 1874–75. The bridge was temporarily strengthened in 1893, to allow electric cars to use it, and the woodwork on the draw was renewed in 1896. A part of the up-stream fender pier has been rebuilt, and ordinary repairs have been made; the sidewalks and the lower planking of the main bridge need repairs, the draw foundation should be pointed, and the fender piers need renewal. The draw and draw foundation are in good condition.

Broadway Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1880–81. It will be rebuilt during the coming year in order to accommodate the changes required in the railroad tracks entering the new South Station. It is now closed except to foot travel.

Brookline-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1884. It is now in good condition.

Brookline-avenue Bridge (over Muddy River, in the Riverway).

This is a semi-circular masonry arch of 15 feet span. It was built in 1892 by the Park Departments of Boston and Brookline, and is maintained by them jointly.

Byron-street Bridge (over Boston, Revere Beach & Lynn R.R.).

This is a wooden bridge, built in 1889. The sidewalks and bulkheads need repairing; otherwise the bridge is in fair condition.

Cambridge-street Bridge (from Brighton to Cambridge).

This is a wooden pile bridge with a wooden leaf draw. It was rebuilt in 1884; the draw was rebuilt in 1891. The bridge is in the care of the Commissioners for the Boston and Cambridge bridges, and the city pays one-half the cost of maintenance. The draw has been provided with new chains and ordinary repairs have been made; repairs are needed on the sidewalks, piers and fender guards and the bridge should be painted; on the Boston side the deck plank on the main bridge and draw should be renewed, the abutment and waterway should be repaired, and the piling under the draw should be strengthened; on the Cambridge side the stringers need additional fastenings near the ends of the draw arms and one draw arm should be renewed.

Canal or Craigie's Bridge.

This is a wooden pile bridge, with a wooden turn-table draw. The city pays one-half the cost of maintenance. The bridge was originally built in 1808, was rebuilt in 1852, and again rebuilt and widened in 1874. The bridge is in the care of the Commissioners for the Boston and Cambridge bridges. About one-half of the sidewalk and sidewalk bulkhead on the north side of the Cambridge end of the bridge was rebuilt, an additional line of stringers was placed under the south sidewalk of the Boston end of the bridge, and considerable paving has been relaid. The sidewalks, sidewalk bulkheads and fencing that have not recently been rebuilt are poor, and need rebuilding; additional stringers are needed near the draw and some pile work is needed near the ends of the bridge, some of the spur-shores need refitting; the roadway should be repaved between the tracks; the up-stream fender guard is in a very poor condition; the draw and draw pier need extensive repairs.

Castle Island Foot-bridge (from Marine Park to Castle Island).

This is a temporary foot-bridge, built in 1892, and is maintained by the Park Department. It connects the Marine park with Castle Island, and is furnished with a draw, so that if desired by the United States authorities, the island can be cut off from the shore; during the past year the draw was run off, and the bridge was closed to travel, as Castle Island was used for defensive purposes during the war with Spain. Repairs have been made on the fence and flooring; repairs are needed on the fence and planking, and the fence should be painted; otherwise the bridge is in fair condition.

Central-avenue Bridge (over Neponset River, Dorchester Lower Mills).

This is an iron bridge, and was built in 1876. The city maintains the part within its limits. A new sidewalk has been built on the up-stream side of the bridge, and several breaks in the deck have been repaired. The woodwork of the roadway is in very poor condition; the bridge should be stripped and painted and the woodwork renewed.

Charles-river Bridge (from Boston to Charlestown).

This is a wooden pile bridge with an iron draw. The present bridge was built in 1854–55; the draw was built in 1870. This bridge will remain in use but a few months longer as that portion which lies between the harbor lines will be removed on the completion of Charlestown bridge; only minor repairs have been made on this bridge; the main bridge is in fair condition.

Charlesgate Bridge (in the Fens over Boston & Albany R.R.).

This is an iron bridge, built in 1881–82, and is maintained by the Park Department. It has been closed part of the year on account of the construction of the bridge over Ipswich street. It is in good condition.

Chelsea Bridge (over Boston & Maine R.R.).

This is an iron bridge, built by the Boston & Maine Railroad Company in 1894, and is over the railroad location. The surface of the bridge is maintained by the city; the remainder by the railroad company. The wheel-guard on

the bridge is too narrow, the fences need repairing and painting; otherwise the bridge is in good condition.

Chelsea Bridge, North (over North Channel, Mystic River).

The city maintains the part within its limits. The original structure was built in 1802–3. The piles under the main bridge were driven in 1880. The upper part of the bridge, the draw and draw foundation were built in 1895. General repairs have been made. The bridge needs painting, and the sidewalk planking needs small repairs; the old fender guard is in poor condition; otherwise the bridge is in good condition.

Chelsea Bridge, South (over South Channel, Mystic River).

This is a pile bridge with an iron draw. The original bridge were built in 1802–3. The piles of the present bridge were driven, and the draw was built in 1877. That part of the bridge above the girder caps was rebuilt at a higher grade, and the draw was raised in 1895. General repairs have been made. The fender guards and the top of the pier are in poor condition; the fences should be painted, and the sidewalk brackets and facias on the draw need repairing; otherwise the bridge is in good condition.

Chelsea-street Bridge (from East Boston to Chelsea).

This is a wooden pile bridge, with an iron swing draw; the original bridge was built in 1834; was rebuilt in 1848, 1873, and again in 1894–95. The bridge has been painted, and is in good condition.

Circuit-drive Bridge (over Scarboro' Pond, in Franklin Park).

This is an elliptical masonry arch of 30 feet span and 6 feet 3 inches rise. It was built in 1893, and is maintained by the Park Department.

Columbus-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1876–77. The ironwork below the floor is very rusty and the under planking should be renewed. But as the changes required on this bridge to accommodate the new tracks to the South Station have not been made this work can well be postponed for another year.

Commercial Point or Tenean Bridge (Dorchester).

This is a wooden pile bridge with a wooden leaf draw. The present bridge was built in 1875. The draw has been planked with three-inch hard pine; this bridge is in poor condition; the draw and most of the woodwork above the piles should be renewed.

Commonwealth-avenue Bridge (in The Fens).

This is an iron bridge, and was built in 1881–82. It has been sheathed during the year, and is now in good condition.

Congress-street Bridge (over Fort Point Channel).

This is a wooden pile bridge with an iron turn-table draw on a stone foundation, and was built in 1874–5. The iron work under the draw has been painted, some of the spur-shores have been refitted, and a portion of the sidewalk and roadway has been rebuilt. The Boston Electric Light Company put a cable box under the channels and pier and beside the bridge; and in connection with this work they tore up and rebuilt a portion of the pier; the up-stream end of the pier was rebuilt in connection with the work on Summer-street bridge. Those parts of the sidewalks not recently rebuilt and part of the roadway flooring are in very poor condition. The track circles are much worn, the roadway paving and the fender guards are in poor condition and the top of the pier is in a dangerous condition. The draw should be provided with new tracks, the lower chord should be uncovered, examined, repaired if necessary, and be painted; the top of the pier should be rebuilt; the centre of the bridge and part of the gutter and sidewalk should be uncovered; the poor timber and planking should be renewed, and the bridge repaved, and some repairs are needed on the cross bracing and fender guards. The bridge will soon be widened twenty feet on the Boston end and filled solid as far as the harbor line.

Cornwall-street Bridge (over Stony Brook, West Roxbury).

This is a small wooden bridge, built in 1892. It is in good condition.

Cottage Farm Bridge (over Boston & Albany R.R., Brighton).

The present bridge was built in 1895–96. With the exception of the plate girders on the outside lines of the bridge, and some special construction under the sidewalks, the superstructure is composed of 20-inch steel beams filled between with brick arches and Portland cement concrete, on

which is a wearing surface of Sicilian rock asphalt. The northerly sidewalk has been built and railings have been placed on the main girders; the sheet lead on the lower flanges of the beams has been torn off in places. The bridge is in good condition.

Cottage-street Foot-bridge (over flats, East Boston).

This is a wooden pile bridge, built in 1889, for foot travel only. Some of the piles are commencing to decay. The cross-bracing is poor, and should be renewed where necessary. The flooring and the fences at the ends of the bridge need repairing; otherwise, the bridge is in fair condition.

Dartmouth-street Bridge (over Boston & Albany R.R. and Providence Division, New York, New Haven & Hartford R.R.).

This is an iron bridge, built in 1878–79. The ironwork of this bridge should be thoroughly cleaned and painted as soon as the extensive changes made necessary by the re-arrangement of the railroad tracks shall be completed.

Dorchester-street Bridge (over Old Colony Division, New York, New Haven and Hartford R.R.).

This is an iron bridge, built in 1839. It is principally maintained by the railroad company, and was repaired and put in fair condition in 1893.

Dover-street Bridge (over Fort Point Channel).

This was originally a wooden pile bridge, built in 1805, rebuilt in 1858–59, and again in 1876. In 1893–94, upon the abolition of the grade crossing of the Old Colony Railroad, the present iron structure resting on masonry piers was built. The sidewalk planking on the draw is poor and should be renewed and the entire bridge should be painted. The planking on the face and top of the draw piers is in poor condition and should be repaired.

Ellicott-arch Bridge (in Franklin Park).

This is a semi-circular masonry arch of 17 feet 6 inches span. It was built in 1889, and is maintained by the Park Department.

Essex-street Bridge (from Brighton to Cambridge).

This bridge is in the care of the Commissioners for the Boston and Cambridge bridges; the city pays one-half the cost of maintenance. It is a wooden pile bridge, with a wooden leaf draw, and was originally built in 1850; the draw was rebuilt in 1891. The woodwork above the piles was renewed in 1896, and this part of the bridge is in good condition. The water pipe has been removed from the up-stream side of the bridge, and new chains have been put on the draw; the draw, draw-way and piers should be replanked, the fender guard on the Cambridge side should be repaired, the curb irons on the Cambridge side need regulating, and the staging under the bridge on the Boston side needs strengthening.

Everett-street Bridge (over Boston & Albany R.R., Brighton).

This is an iron bridge, built in 1891, by the Boston & Albany Railroad. It is in good condition, and needs only minor repairs to some of the woodwork. It should be painted during the present year.

Federal-street Bridge (over Fort Point Channel).

This is a wooden pile bridge, with a double retractile iron draw, and was rebuilt in 1891–92. The sidewalks and central ways on the draw need replanking, and the bridge needs painting. The draws work hard, part of the trouble arising from the driving of the piles by the Boston Terminal Company at the rear of the foundation; this work raised part of the foundation 4½ inches and crowded it out of position; the track should be lowered to its former level, the trucks should be thoroughly cleaned, and some of the rails may have to be re-aligned. The cross-bracing that has been damaged by floating piles should be repaired, and the piles that lodged in the bents under the bridge should be removed. (See page 107.)

Fen Bridge (in the Fens).

This bridge was built in 1891–92. It is in good condition.

Ferdinand-street Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1892. The lower planking is poor, and the ironwork below the floor should be cleaned and painted. This is another bridge which has been closed to team travel during a portion of the year, on account of the changes incident to the rearrangement of the railroad tracks.

Forest Hills Entrance Bridge (in Franklin Park).

This bridge was built in 1894–95. It is maintained by the Park Department, and is in good condition.

Gold-street Bridge (over New England Railroad).

This bridge was built in 1895, replacing a foot-bridge which was built in 1890. The bridge has been opened for travel. The fences are badly cut; they should be repaired; the bridge should be painted, and the roadway should be resheathed; the walls need a little pointing.

Granite Bridge (from Dorchester to Milton).

This is a wooden pile bridge, with a wooden leaf draw. The city maintains the part within its limits. The bridge was originally built in 1837. The bridge should be redecked, the abutment should be repaired, and the bridge should be painted.

Harvard Bridge (from Boston to Cambridge).

This is an iron bridge with an iron turn-table draw, and was built in 1887–91. The bridge is in the care of two Commissioners, one appointed from Boston, and one from Cambridge, and the expense of maintenance is borne equally by each city. The roadway has been sheathed during the year, and a bicycle path three feet wide at the curb on each side of the bridge has been built. The whole bridge should be painted this year.

Harvard-street Bridge (over New England R.R.; Midland Division, New York, New Haven & Hartford R.R., Dorchester).

During the past year the city has built a sidewalk on the in-town side of the bridge; both sidewalks are supported by the city, the old part of the bridge being maintained by the railroad; the brickwork under the new walk is in poor condition, otherwise the sidewalks are in good condition.

Huntington-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge. It was built in 1872, and in 1876–77 the abutments were rebuilt, and the bridge widened by the addition of two new girders. In 1896, in consequence of changes in the grade of the avenue, the floor was entirely rebuilt, the ironwork thoroughly cleaned and painted, and

new girders added for supporting the water pipes. The bridge is now in good condition.

Ipswich-street Bridge (over Waterway in the Fens).

See page 101.

Irvington-street Foot-bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This is an iron foot-bridge, built in 1892, and is now in good condition. Mason safety treads have been put on the stairways during the year.

L-street Bridge (over Reserved Channel, South Boston).

This is a wooden pile bridge, with an iron retractile draw. It was built in 1892. The draw-tender's houses have been painted. Part of the draw foundation was damaged by a storm in November, 1898, and has been repaired. The asphalt walks are badly cracked and the ladder at the end of the down-stream pier is broken. The bridge is in good condition.

Leverett-pond Foot-bridge (in Leverett Park).

This is a segmental masonry arch of 24 feet span and 5 feet 5 inches rise. It was built in 1894, and is maintained by the Park Department.

Leyden-street Bridge (over Boston, Revere Beach & Lynn R.R.).

This is an iron bridge, built in 1889. The roadway is generally very dirty and should be cleaned oftener. It is in good condition.

Linden Park-street Bridge (over Stony Brook).

This is a wooden bridge, built in 1887. The sidewalk planking is very thin, and should be renewed, and the entire bridge painted.

Longwood-avenue Bridge (over Muddy River and B. & A. R.R.).

The old wooden bridge was closed to team traffic in April, 1897, and the structure removed. A contract was made August 6, 1897, with Messrs. Woodbury & Leighton for a new masonry bridge, and the work was so far completed that

the avenue was opened again to public travel December 28, 1898. Considerable work still remains to be done, but it is expected that early in the summer the new structure will be completed.

Malden Bridge (from Charlestown to Everett).

The present structure was built in 1875, and the draw in 1892. The ends of the pier have been strengthened, and a few general repairs have been made. The bridge is in very poor condition, and should be rebuilt.

Massachusetts-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1876. It was thoroughly repaired in 1893, with the exception of the wooden fences. These fences are now in very poor condition, and should be rebuilt, and the girders painted this year.

Massachusetts-avenue Bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This is an iron bridge, built in 1876. It is in good condition with the exception of the lower planking, this should be renewed.

Mattapan Bridge (from Dorchester to Milton).

The city maintains the part within its limits. This is an old iron bridge and is in a dangerous condition, and it should be replaced by a stone bridge; the iron girders have been painted.

Meridian-street Bridge (from East Boston to Chelsea).

This is a wooden pile bridge, with a wooden turn-table draw on a pile foundation. The original structure was built in 1858. It was rebuilt soon afterwards, and was widened and rebuilt in 1884, excepting the draw, which was built in 1875–76. The chords of the draw were rebuilt in 1896.

The waterways have been repaired, the rods in the chords have been tightened, and other general work has been done. Additional repairs are needed on the waterways, the facias on the sidewalks are getting poor, the stringers and bulkhead at the Boston end of the channel need strengthening, the draw should be furnished with some new rack, the track is getting much worn, and one of the rods under the draw should be repaired.

Milton Bridge (from Dorchester to Milton).

The city maintains the part within its limits. The original structure is very old. It was widened in 1871–72. The older part of this bridge was built of stone, and the widening is an iron structure on stone columns. Small repairs have been made on the sidewalk. The bridge should be painted, the sidewalk planking should be renewed and additional stringers should be placed under the up-stream sidewalk; one of the cap stones over the first waterway is cracked.

Mt. Washington-avenue Bridge (over Fort Point Channel).

This is a wooden pile bridge, with an iron draw. It was built in 1854, and rebuilt in 1870–71; this bridge is in poor condition. It has the only draw of importance in the city that is moved by hand power; the draw-pier is in poor condition, and is so low that it is covered with water at every high course of tides. At the Boston end the bridge was shortened about 22 feet, some of the fender-guards and about 60 feet of the bridge were rebuilt in connection with building the Dorchester avenue sea-wall. New sidewalks have been built on the draw, the deck has been patched, and other general work has been done. The sidewalks, roadway pavement and one of the fender guards are in very poor condition, the waterways are out of repair, the foundation of the house is in poor condition. The bridge should be rebuilt.

Neponset Bridge (from Dorchester to Quincy).

The city maintains the part within its limits. The original structure was built in 1802, and the present one in 1877. The draw is too heavy to be handled by hand, and should be replaced by a turn-table draw. Only general repairs have been made. The piers and fender-guards need extensive repairs, and the draw should be painted.

Neptune-road Bridge (over Boston, Revere Beach & Lynn R.R.).

This is an iron bridge, built in 1887–88, and is maintained by the Park Department. The bridge is in good condition, except the roadway plank which should be renewed.

Newton-street Bridge (over Providence Division, New York New Haven & Hartford R.R.).

This is an iron bridge, built in 1872. It is in good condition, excepting the concrete sidewalks, which should be resurfaced.

North Beacon-street Bridge (from Brighton to Watertown).

The city maintains the part within its limits. This is a wooden pile bridge with a wooden leaf draw. The original structure was built in 1822, and the present one in 1884.

The Newtonville and Watertown Street Railway Company laid a track across the bridge last summer, and cars began running over it late in August, the bridge being previously strengthened by the railroad company by the addition of six piles, two new lines of stringers under the rails and three new draw arms, one other draw arm has also been renewed, and the sidewalk has been replanked. The bridge is in poor condition, the old arms still remaining in the draw; some of the piles and deck planking need renewal, the stringers have begun to decay; the wheel guard needs repairing; the painting and the pier are in poor condition.

North Harvard-street Bridge (from Brighton to Cambridge).

The city maintains the part within its limits. This bridge was originally built in 1662, and was rebuilt, except the piling, in 1879; the draw was built in 1891. The bridge is in the care of the Commissioners for the Boston and Cambridge bridges; the city pays one-half the cost of maintenance. Only ordinary repairs have been made. The abutment, piling, roadway plank and fence are in poor condition. This bridge should be replaced with a new and wider structure, more in keeping with the improvements being made in the vicinity.

Prison-Point Bridge (from Charlestown to Cambridge).

This bridge was originally built in 1833, and the present structure was built in 1876–77. It is a wooden pile bridge, with an iron leaf draw. The bridge is in the care of the commissioners for the Boston and Cambridge bridges; the city pays one-half the cost of maintenance. It is in poor condition. Only ordinary repairs have been made on the bridge. The draw, machinery, hinges, sidewalks and the woodwork on the main bridge near the channel need thorough repairing; the top of the pier also needs repairing; this bridge will probably be soon rebuilt at a higher grade, owing to the abolishing of the grade crossing of the Boston & Maine Railroad.

Public Garden Foot-bridge.

This is an iron bridge. It was built in 1867, and was thoroughly repaired in 1887. Some of the woodwork has been renewed, and the bridge is now in fair condition.

Scarboro' Pond Foot-bridge (in Franklin Park).

This is an elliptical masonry arch of 40 feet span and 8 feet 3 inches rise. It was built in 1893, and is maintained by the Park Department.

Shawmut-avenue Bridge (over Boston & Albany R.R.).

This is an iron bridge, built in 1871, although it was cleaned and painted in 1897, parts of it, particularly over the main tracks, are very rusty. The recommendation made in the reports for 1896 and 1897 is again renewed that the cast iron covering over the sidewalk girders, which has not been removed since the bridge was built, be taken off, so that a thorough examination can be made of the condition of these girders.

Spring-street Bridge (from West Roxbury to Dedham).

This is a stone bridge. The city maintains the part within its limits. It is in good condition.

Stony-brook Bridge (in the Fens).

This is an ornamental brick arched bridge, with stone facings, built in 1891–92, and maintained by the Park Department. It is in good condition.

Swett-street Bridges (over South Bay Sluices).

These are wooden bridges, built in 1875, as temporary structures; the westerly bridge has a new 4-inch spruce deck and new sidewalk planking; the wing bulkheads are in poor condition, some new fence posts and bracing are needed. The easterly bridge is in very poor condition, and extensive repairs should be made on it immediately.

Tremont-street Bridge (over Muddy River).

This is a semi-circular masonry arch of 15 feet span. It was built in 1893, and is maintained by the Park Departments of Boston and Brookline.

Warren Bridge (from Boston to Charlestown).

This is a wooden pile bridge, with a double retractile iron draw. The present structure was built in 1883–84. The concrete walks have been resurfaced, a new winch head has been provided, and general repairs have been made on the bridge and machinery. The track timbers, fender-guards,

upper parts of the pier and wharves, the planking on the waterway, the sidewalk bulkheads and the fencing are in poor condition; the planking on the sidewalks is poor in places; the curbs on the draw should be straightened.

West Boston Bridge (from Boston to Cambridge).

This is a wooden pile bridge, with a wooden turn-table draw. The bridge was originally built in 1792–93, was rebuilt in 1854, and repaired in 1871; it is in the care of the Commissioners for the Boston and Cambridge bridges; it is an old weak bridge, and only necessary repairs have been made. Preliminary plans have been made for a new bridge to take its place. Work has been commenced on the temporary highway bridge, and when completed it will be opened, and West Boston bridge will be closed to travel.

West Fourth-street Bridge (over Old Colony Division, New York, New Haven & Hartford R.R.).

In 1893–94 the grade crossing of the Old Colony Railroad on this street was abolished, and an iron bridge built, extending from the end of Dover-street bridge at the South Boston side of Fort Point channel to the easterly line of Foundry street. The surface is maintained by the city, the rest of the structure by the railroad company. The sidewalk planking is in poor condition, and the lower planking on the roadway should be renewed this year. The ironwork needs painting.

West Rutland-square Foot-bridge (over Providence Division, New York, New Haven & Hartford R.R.).

This is an iron foot-bridge, built in 1882, it is now in good condition.

Western-avenue Bridge (from Brighton to Cambridge).

The present bridge was built in 1879–80, and the draw in 1891. It is in the care of the Commissioners for the Boston and Cambridge bridges, and the city pays one-half the cost of maintenance. Only general repairs have been made. A new cap is needed under the draw; some of the piles need strengthening; the stringers at the ends of the draw arms need refastening; the piers need new facias and new planking; the up-stream fender-guard should be rebuilt; the waterway should be repaired; the planking on the draw is getting old; and will soon need renewal; the draw piers are too short.

Western-avenue Bridge (from Brighton to Watertown).

The city maintains the part within its limits. This is a wooden pile bridge, with an iron draw, and was rebuilt in 1892–93. The Boston end of this bridge has been painted, and general repairs have been made; the Watertown end is very rusty. The draw and its bearings should be adjusted, and scupper holes should be made in the flooring of the draw foundation.

Winthrop Bridge (from Breed's Island to Winthrop).

This is a pile bridge without a draw. It was originally built in 1839; it was rebuilt in 1851, and was extensively repaired in 1870. This is an old bridge, and is only in fair condition; the caps need additional fastenings. A few bolsters and stringers need strengthening, and some new piles are needed to replace others that have been eaten by the limnoria. The fences and sidewalks should be repaired.

Bridges wholly Supported by Railroad Corporations.

The bridges maintained by the several railroad companies are in good or fair condition, with the exceptions noted below.

All the New England railroad bridges over the cut in South Boston are in need of more or less repair, and one of them, Silver-street bridge, is in very poor condition; the stringers of all of them should be examined by removing the planking, and the woodwork should be renewed where necessary. Norfolk-street bridge, near the Dorchester station, over the same railroad, is in poor condition.

SURVEYING DIVISION.

The work of the Surveying Division has been of about the same volume as for the year 1897. The same number of men have been employed, and the aggregate amount of work for the several city departments has been about the same, although somewhat differently distributed.

The number of orders attended to for the Building Department is naturally less than for the previous year, as the number of buildings erected during the year was affected by the uncertain political conditions during the spring and summer.

The surveys in connection with Sewerage Works, ordered by the Street Commissioners, acting under authority of chapter 426 of the Acts of 1897, have continued through the year, and have necessitated the employment of twelve men continuously.

Twenty plans have been made showing surveys of the amount of land taken for sewer purposes for a total length of one and one-fifth miles, covering forty-one estates.

Sewer plans have been completed showing proposed changes in brooks, streams, etc., for care of surface water covering a distance of nearly seven miles, and showing land taken from one hundred and twenty-nine estates.

The survey of the territory bounded by the Charles river, Beacon, Mt. Vernon, Temple, Lynde and Leverett streets, for the Water Department, in connection with the preparation of plans showing the location of water pipes, which was begun in July, 1897, has been carried on to completion.

Changes in the boundary lines between Boston and the adjacent municipalities have been made during the year by the following legislative acts, duplicate plans of which were made by the Surveying Division, one copy of which is on file in the office of the Secretary of State and the other in the office of the City Engineer of the City of Boston:

Between Boston and Newton at and near Commonwealth avenue, chapter 242, Acts of 1898. Approved by the Governor, March 29, 1898.

Between Boston and Newton at and near Nonantum street, chapter 431, Acts of 1898. Approved by the Governor, May 13, 1898.

Between Boston and Cambridge, from Harvard bridge and the West Boston bridge through the Charles river, chapter 243, Acts of 1898. Approved by the Governor, March 29, 1898.

Between Boston and Hyde Park at and near Ashland street, chapter 251, Acts of 1898. Approved by the Governor, April 1, 1898.

By chapter 298, Acts of the Legislature of 1898, the City of Boston was authorized to lay out as public alleys all passageways less than twenty-five feet in width, the cost of laying-out and construction to be assessed upon the abutters.

By order of the Board of Street Commissioners, acting under this act, there have been prepared plans of fifty-eight public alleys, representing a total length of 23,000 feet or about 4.36 miles.

These public alleys are numbered numerically, according to their location in districts into which the city has been divided for the purpose. This division has been made in such a manner that no district shall contain more than one hundred public alleys. Thus Public Alley No. 1 is understood to be in district No. 1, also all alleys bearing numbers less than one hundred. District No. 2 includes all alleys numbered from 101 up to 200, and so on.

By chapter 419 of the Acts of the Legislature of 1897, the City of Boston was authorized to assess the cost of street watering upon the abutters. The duty of making this assessment was delegated to the Superintendent of Streets, for whom this division furnished the frontages of all estates abutting on public streets in the city proper, South Boston, East Boston, Roxbury and Charlestown, and parts of Dorchester, West Roxbury and Brighton, within a radius of four miles from the City Hall.

The frontages of over 50,000 estates were thus obtained, representing a total length of about 525 miles.

Important changes in the grades of a number of streets have been ordered by the Superior Court, occasioned by the change of location of the Old Colony Railroad, between Columbia road and South Boston. Plans showing the changes have been made of the following streets, viz.: Dorchester avenue, Howell street, Washburn street, Rawson street, Powell street, Boston street, Ellery street, Swett street, Dexter street, Albert street and Kemp street.

Surveys and plans have been made for the widening of Charlestown street, from Haymarket square to Causeway street. The street thus widened will be ninety-two feet wide and will make direct connection with the new Charlestown bridge.

That an easy grade might be established for the approach to the new bridge it has been necessary to raise the grades of the adjacent streets, and for this purpose plans have been prepared for the revision of grade of the following streets, viz.: Causeway street, Commercial street, Endicott street, Prince street, Medford street and Charles River avenue.

Surveys and plans have been made for school purposes for the taking of land for a High School in East Boston, on Marion street, between Princeton street and Saratoga street, and for a Grammar School in Dorchester, on Perth street, between Quincy street and Phipps avenue, also for additions to present school sites at Thomas park, South Boston, the Warren School, and the Monument street, Charlestown, the Munroe-street School, Roxbury, and Bailey-street and School-street schools in Dorchester.

Plans involving surveys for other public purposes include bath-house lots on East Ninth street, South Boston, Cabot street, Roxbury, and Orchard park, Roxbury, a Gymnasium lot on Paris street, East Boston, an addition to engine-house lot on Allbright court, Dorchester and the paving yard, Chelsea street, East Boston.

A survey has been made of the cemetery on Walter street, West Roxbury, and a plan of the same has been prepared for the Cemetery Department. Surveys of other cemeteries are in progress.

The work of the department has been considerably increased by reason of the passage, by the Legislature, of chapter 134, Acts of 1898, which require cities and towns to file in the Registry of Deeds a plan of all lands which are purchased or taken for public sewer, street or highway purposes, within sixty days after the passage of its order or vote so to purchase or take.

Two hundred and twenty-one plans and profiles representing a total length of 31.38 miles, showing 2,128 buildings, property owners' names, established grades, areas of land taken, or to be taken for street widenings or relocations, public alleys, etc., were completed for the Street Laying-Out Department and for the Paving Division of the Street Department.

A complete list giving all plans made during the year will be found in the appendix.

The demands upon this division for additional work have made it necessary at times, as in former years, to call into its service several surveying parties from the Street Laying-Out Department.

Estimates for the construction of eighteen streets have been prepared and submitted to the Street Commissioners.

Thirty-six plans of private streets submitted by property owners, for the approval of the Street Commissioners, have been examined as to the proper lines and grades, the approval or revision of which have required in many cases additional work on the ground.

Locations of eight hundred fifty-two catch-basins on one hundred eighty-six different streets were furnished the Paving and Sewer Divisions of the Street Department. The lines and grades of a large portion of these were marked on the ground, and all of them were located upon plans made for the purpose.

Lot frontages were obtained for the Sewer Division, for sewer assessment purposes, on fifty-three different streets and eighty-two accident and other plans were made for the Law Department.

There are now filed in the Surveying Division a total of three hundred eighty-one plans, size 4 feet by 4 feet, made by the Board of Survey, and the Board of Street Commissioners, under the provision of chapter 323 of the Acts of 1891 and amendments thereto, showing proposed development of territory in outlying districts.

The plans and other data on record in the department occasionally prove of much service to the local historian.

At one time during the year the following information was furnished to one who was making a review of important events during the last fifty years, and may be of interest to those who read this report:

Digging down of Fort Hill commenced September, 1866.

Mill Pond, north of Haymarket square filled up, 1845.

Streets began to be built on South Cove lands in 1846.

Filling of Back Bay carried out in accordance with agreements made in 1856 and 1864.

Raising of Suffolk-street District, under Act of Legislature passed June 4, 1868.

Raising of Church-street District under Act of Legislature passed June 1, 1867.

Atlantic-avenue extension, Commercial street to Broad street, December 18, 1868.

Hanover street widening Court street to Blackstone street, December 31, 1868.

Blackstone street to Commercial street, October 15, 1869.

Washington-street extension from Cornhill to Haymarket square, November 6, 1872.

Shawmut-avenue extension, Dover street to Tremont street, October 10, 1870.

Streets widened after fire, November 9, 1872.

Public Garden:
Lands offered for sale 1853.
Pond completed, 1861.
Iron fence completed 1863.
Stone bridge bridge across the pond completed 1867.
Annexations:
Washington Village to Boston, June 10, 1855.
Charlestown to Boston, January 5, 1874.
Roxbury to Boston, January 6, 1868.
Dorchester to Boston, January 3, 1870.
West Roxbury to Boston, January 5, 1874.
Brighton to Boston, January 5, 1874.
The Metropolitan, South Boston and Cambridge Horse Railways opened for travel, 1856.
The Middlesex in 1857.
Cars run through Cornhill, 1867.
Tolls taken off Charles river bridge, April 30, 1858.
Tolls taken off Chelsea bridge, May 6, 1850.
Craigie's bridge made free, February 1, 1858.
Warren bridge made free, April 30, 1858.
West Boston bridge made free, February 1, 1858.

In connection with the Surveying Division there have been 4,304 titles examined, 2,587 deeds and 532 plans copied from the Registry of Deeds.

Of these, 1,707 titles were examined, 1,002 deeds and 203 plans copied in connection with surveys and plans of sewerage works for the Street Commissioners, under chapter 426 of the Acts of 1897.

The following list gives the number of orders attended to for property owners, builders and the various city departments, from February 1, 1898, to February 1, 1899:

Street lines given	457
Street grades given	371
Street Department, Paving Division	1,480
Street Department, Sewer Division	798
Street Department, Street Watering Division	1
Buildings Department	4,427
Public Buildings Department	54
Public Grounds Department	5
Law Department	82
Street Commissioners	424
Engineering Department	125
Park Department	11
Water Department	9
Carried forward	8,244

Brought forward	8,244
Police Department	10
Public Bath Department	4
Fire Department	2
Cemetery Department	3
School Committee	6
Mayor and City Council	9
Total	8,278

Thirteen hundred and fifteen blue prints have been made during the year.

List of plans for sewerage works made during the year ending February 1, 1899:

PLANS FOR BROOK TAKINGS.

Dorchester.

	Length in feet.
Canterbury branch of Stony brook, from Franklin field to Harvard street	6,040
Davenport brook, from Dorchester avenue to rear of Magdala street	380
Freeport-street brook, from Pleasant street to tide-water between Dorchester avenue and Old Colony Railroad	1,050
Harvard-street brook, from Calder street to Franklin field	380
Mattapan brook, from Morton street and Selden street, to Blue Hill avenue, at New England Railroad	5,460
Oakland Garden branch of Stony brook, from Harvard street to Franklin field	2,640
Tenean Creek, Park street to main channel	420
West Selden street, from W. Selden street, to Neponset river	1,480

West Roxbury.

Canterbury branch of Stony brook, from Harvard street to main channel	5,200
May street, from May street to parkway	390

Brighton.

Faneuil Valley brook, from Lake street to Washington street	1,075
Carried forward	24,515

	Length in feet.
Brought forward	24,515
Salt Creek brook, from Commonwealth avenue, across Boston & Albany Railroad to tide water .	1,160
Shepard brook, from Shannon street to the Wool pond	9,300
Sutherland road brook, from Kilsyth road to Sutherland road	530
Total	35,505

PLANS FOR SEWER TAKINGS.

Dorchester.

	Feet.
Adams street, from Adams street to Milton Branch Railroad	610
Carlisle street, from Centre street, southeasterly .	225
Ceylon street, from Columbia road to Quincy street .	900
Ferndale street, extension to Southern avenue .	140
Idaho street, from River street to Metropolitan sewer	230
Savin Hill, from Sydney street to Endleigh street .	1,530
Sydney street, from Sydney street to Marsh land .	270
Van Winkle street, from Van Winkle street to Bushnell street	145

West Roxbury.

Brookside avenue, from Brookside avenue to Argyle street	330
Keith street and Lasell street, between . . .	290
Rosemary street, from Rosemary street to Spalding street	195
Spalding street, from South street to Old Colony Railroad land	460

Roxbury.

Lamont street, from Lamont street to land of Williams	58

Charlestown.

Roland street, taking in Somerville . . .	124

Brighton.

Harriet street, from Harriet street to Faneuil street	685
Total	6,192

The following table gives the monthly amounts of paving work measured by the Surveying Division of the Engineering Department for the year ending January 31, 1899:

1898.	Feet of Edgestone set.	Square Yards Block-stone Paving and Crossings.	Square Yards Round-stone Paving.	Square Yards Brick Paving.	Square Yards Artificial Stone.	Coal Tar Concrete.
February	None	None	None	None	None	
March	517		158	206	42	
April	1,913	2,189	536	1,760	675	
May	8,988	3,917	1,802	4,820	608	
June	11,220	7,519	1,915	5,530	1,239	
July	6,870	6,829	1,117	4,533	855	
August	3,766	3,971	763	1,118	1,092	
September	11,627	6,013	2,988	8,106	2,245	
October	14,810	11,663	2,650	8,329	633	1,619
November	10,067	11,245	1,762	7,069	1,525	
December	5,714	1,918	558	2,459	2,116	
January, 1899	1,499	1,277			622	
Totals	76,991	56,541	14,249	43,930	11,652	1,619

As a matter of record, the following list is given of the work done for the Paving Division of the Street Department, from February 1, 1898, to February 1, 1899:

BOSTON PROPER.

Allen street, plan and profile of edgestone for grade.

Allen street, Charles street to Brighton street. Line and grade for edgestone.

Atlantic avenue, westerly side, Central street to Central Wharf. Grade for edgestone.

Atlantic avenue, northerly corner Summer street. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Atlantic avenue, No. 615. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Atlantic avenue, at Fort Hill Wharf. Line and grade for edgestone.

Atlantic avenue, Long Wharf to Commercial Wharf. Line and grade for edgestone and measurement of edgestone, roadway and sidewalk paving.

Atlantic avenue, Nos. 251–253. Line and grade for edgestone.
Bay street, off Fayette street. Plan and profile of edgestone for grade, grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.
Beach street, easterly corner Utica street. Grade of edgestone tested.
Beacon street, easterly corner Hereford street. Grade of edgestone tested.
Berwick park, grade for edgestone, measurement of edgestone, gutter, crosswalk and sidewalk paving.
Blackwood street, northeasterly side. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.
Blackwood street, southwesterly side. Line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.
Bond street, westerly corner Milford street. Measurement of sidewalk paving.
Bothnia street, at Boylston street. Measurement of edgestone, gutter and sidewalk paving.
Boylston street, No. 144. Measurement of sidewalk paving.
Boylston street, southeasterly side, Massachusetts avenue to Bothnia street. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.
Bowdoin street, Cambridge street to Allston street. Measurement of edgestone, gutter, crosswalks and sidewalk paving.
Charles street, easterly corner Fruit street. Line and grade for edgestone, and measurement of edgestone and roadway paving.
Dartmouth street, northerly corner Stuart street. Measurement of sidewalk paving.
Dartmouth street, southwesterly side, Columbus avenue to bridge. Grade of edgestone tested.
Dartmouth street, southerly corner Harwich street. Plan and profile for grade.
Dundee street, No. 45. Grade of edgestone tested and measurement of sidewalk paving.
Dundee street, Nos. 59 to 69. Grade of edgestone tested, line and grade for edgestone, and line and grade of edgestone tested.
Dundee street, Nos. 49 to 57. Measurement of sidewalk paving.
East Concord street, Washington street to Harrison avenue. Plan and profile of edgestone for grade.
Eaton street, measurement of sidewalk paving.
Essex street, westerly corner Oxford street. Line and grade of edgestone tested (twice).
Fayette street, line and grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.
Federal street, northwesterly corner Summer street. Grade of edgestone tested.

Fruit street, easterly corner Charles street. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Hayward place, Nos. 18 to 22. Grade of edgestone tested, grade for edgestone, and grade of edgestone tested.

Hereford street, northerly corner Boylston street. Grade for edgestone and measurement for assessment.

Hereford street, southerly corner Commonwealth avenue. Grade for edgestone and measurement for assessment.

Hereford street, easterly corner Beacon street. Grade of edgestone tested, grade for edgestone and grade of edgestone tested.

Hull street, plan and profile of edgestone for grade, line and grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.

India street, No. 68. Measurement of sidewalk paving.

Kneeland street, at Tyler street. Measurement of edgestone, roadway and sidewalk paving.

Lewis street, westerly corner North street. Line and grade for edgestone.

Margaret street, measurement of edgestone, roadway and sidewalk paving.

Melrose street, plan and profile of edgestone for grade, grade for edgestone, and measurement of edgestone, roadway and sidewalk paving.

Milford street, westerly corner Bond street. Grade of edgestone tested and measurement of sidewalk paving.

Mt. Vernon street, No. 26. Measurement of sidewalk paving.

Norway street, Nos. 37 to 43. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Parkman street, North Grove street to North Russell street. Measurement of edgestone, roadway and sidewalk paving.

St. Botolph street, easterly corner Blackwood street. Line and grade of edgestone tested and measurement of sidewalk paving.

St. Germain street, Nos. 43 to 65. Line and grade of edgestone tested, line and grade for edgestones, line and grade of edgestone tested, and measurement of sidewalk paving.

St. Germain street, Nos. 27 to 31. Line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.

St. Germain street, Nos. 33 to 41. Line and grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.

Sheafe street, plan and profile of edgestone for grade, line and grade for edgestone, and measurement of crosswalk, roadway and sidewalk paving.

Summer street, northerly corner Atlantic avenue. Line and grade for edgestone, grade of edgestone tested, and measurement of sidewalk paving.

Tyler street, Curve street to Harvard street. Plan and profile of edgestone for grade and line and grade for edgestone.

Tyler street, Harvard street to Beach street. Line and grade for edgestone and measurement of edgestone, gutter, crosswalks, and sidewalk paving.

Wellington street, Columbus avenue to Carleton street. Plan and profile of edgestone for grade, line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

West Concord street, Washington street to Shawmut avenue. Plan and profile of edgestone for grade.

West Dedham street, Tremont street to Shawmut avenue. Grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Willard street, line and grade for edgestone and measurement of edgestone, roadway and sidewalk paving.

Winchester street, Ferdinand street to Church street. Plan and profile of edgestone for grade.

SOUTH BOSTON.

B street, West Sixth street to West Seventh street. Measurement and levels on edgestone, line and grade for resetting edgestone, and measurement of edgestone, roadway, crossing and brick sidewalk repaving.

B street, between West Fourth street and West Sixth street. Measurement of sidewalk, edgestone and roadway paving.

B street, between West Fourth street and West Seventh street. Measurement of paving over sewer trench.

Congress street, at New England R.R. Line and grade for edgestone, and measurement of edgestone and roadway paving.

Dorchester avenue, between D street and Dexter street. Measurement of sidewalk, edgestone and roadway paving.

Dorchester avenue, between Old Colony R.R., and D street. Measurement of roadway paving.

Dorchester avenue, between Dexter street and Andrew square. Line and grade for resetting edgestone and measurement of roadway paving.

Dorchester street, easterly corner Vale street. Levels to test edgestone and sidewalk.

East Second street, Nos. 722–726. Line and grade for edgestone.

East Third street, Nos. 572–588. Line and grade for edgestone.

East Third street, Nos. 596–602. Estimate for edgestone required, and line and grade for setting edgestone.

East Fourth street, between H street and I street. Line and grade for resetting edgestone, and measurement of sidewalk, edgestone, gutter and crossing paving.

East Fourth street, between M street and N street, southerly side. Measurement of sidewalk, edgestone and gutter paving.

East Fifth street, No. 511. Line and grade for edgestone.

East Fifth street, between I street and K street. Line and grade for resetting edgestone and measurement of sidewalk, edgestone and gutter paving.

Emerson street, between K street and L street. Line and grade for resetting curb.

Loring street, between West Seventh street and West Eighth street. Line and grade for resetting edgestone and measurement of sidewalk, edgestone, gutter and crossing paving.

Old Harbor street, No. 96. Line and grade for edgestone.

Vale street, easterly corner Dorchester street. Line and grade for edgestone, levels to test edgestone and sidewalk, and measurement of sidewalk and edgestone paving.

Vale street, Nos. 7–17. Estimate of edgestone required, line and grade for edgestone and levels to test edgestone.

Vale street, Nos. 6–8. Line and grade for edgestone.

West Eighth street, northeasterly corner Loring street. Line and grade for resetting edgestone.

Woodward street, between Dorchester avenue and Dorchester street. Line and grade for resetting edgestone and measurement of sidewalk, edgestone and gutter paving.

EAST BOSTON (INCLUDING BREED'S ISLAND).

Bennington street, at Parkway. Measurement of crossing.

Breed street, between Leyden street and Ashley avenue. Line and grade for edgestone and measurement of edgestone, gutter and crossing paving.

Bremen street, No. 366. Line and grade for edgestone.

Brooks street, easterly side between Morris street and Chelsea street. Line and grade for edgestone and measurement of edgestone, gutter and brick sidewalk repaving.

Brook street, between West Eagle street and White street. Measurement of edgestone, gutter and brick sidewalk repaving.

Central square, measurement of crossing and roadway paving.

Chelsea street, Marion street, Morris street and Paris street. Plan of City Paving Yard and City Sewer Yard.

Chelsea street, northerly corner Brooks street. Measurement of brick sidewalk repaving.

Decatur street, between Border street and Meridian street. Measurements and levels on edgestone, line and grade for resetting edgestone and measurement of edgestone, gutter driveway, crossing and brick sidewalk repaving.

East Eagle street, northerly side, at Chemical works and West End power-house. Measurement of driveway and gutter paving.

Eutaw street, Meridian street to Border street. Measurement of edgestone, gutter, driveway and brick sidewalk repaving.

Falcon street, No. 143. Line and grade for resetting edgestone.
Horace street, No. 87. Line and grade for resetting edgestone.
Horace street, No. 87. Levels on edgestone for artificial stone sidewalk.
Jeffries street, between Maverick street and Everett street. Measurement of crossings and driveway repaving.
Lexington street, northerly side, between Marion street and No. 98. Levels and measurements on edgestone and line and grade for resetting edgestone and measurement of edgestone, brick sidewalk repaving and new roadway paving.
London street, Nos. 221–223. Line and grade for setting edgestone.
London street, southerly corner of Porter street. Line and grade for edgestone and measurement of edgestone, gutter and brick sidewalk paving.
Marginal street, between Cottage street and B. R. B. and L. R.R. Measurement of edgestone and roadway repaving.
Maverick street, No. 196. Line and grade for setting edgestone.
Maverick street, No. 236. Line and grade for setting edgestone.
Maverick street, at Jeffries street. Measurement of crossing.
Maverick square, Measurement of roadway repaving.
Meridian street, between Maverick square and Central square. Measurements and levels on edgestone and electric car tracks, line and grade for resetting edgestone and measurement of edgestone, gutter, driveway, crossing and brick sidewalk repaving.
Morris street, between Brooks street and Putnam street. Line and grade for edgestone and measurement of edgestone, gutter and brick sidewalk paving.
Paris street, at Meridian street. Measurement of roadway and gutter repaving.
Paris street, Nos. 216 and 218. Line and grade for setting edgestone.
Paris street, No. 146. Line and grade for edgestone and measurement of edgestone, gutter, driveway and brick sidewalk paving.
Pope street, Nos. 5 to 14. Line and grade for edgestone and measurement of edgestone, gutter, driveway and brick sidewalk paving.
Porter street, No. 33. Line and grade for resetting edgestone.
Putnam street, No. 291. Line and grade for setting edgestone.
Putnam street, between Chelsea street and Bremen street. Line and grade for edgestone and measurement of edgestone, gutter and brick sidewalk paving.
Webster street, B. and M. R.R. to Lewis street. Measurement of edgestone, driveway, roadway and brick sidewalk repaving.
W. Eagle street, No. 78. Line and grade for setting edgestone.

W. Eagle street, northerly side, Meridian street, to Brooks street. Plan showing frontages, edgestone and brick sidewalks and amount of edgestone required.

CHARLESTOWN.

Alford street, Main street to Malden bridge. Plan and profile of edgestone for grade.

Arlington avenue, southerly side, between Beacham street and Dorrance street. Measurements and levels for fixing grade, line and grade for setting edgestone and measurement of edgestone and gutter paving.

Arlington avenue, between Alford street and Dorrance street. Measurement of edgestone, gutter, driveway and brick sidewalk repaving.

Beacham street, between Main street and Arlington avenue. Line and grade for edgestone and measurement of edgestone, gutter, crossing, driveway and brick sidewalk paving.

Call street, Park street to Chelsea street. Measurements and levels on edgestone, line and grade for resetting edgestone and measurements of edgestone, gutter, driveway and brick sidewalk repaving.

Chestnut street, between Monument square and Chelsea street. Measurements and levels for profile of edgestone, line and grade for resetting edgestone and measurement of edgestone, gutter, driveway, crossing and brick sidewalk repaving.

Eden street, Main street to Russell street. Measurements and levels on edgestone.

Harvard street, Washington street to Devens street. Measurement of edgestone, gutter, driveway and brick sidewalk repaving.

Joiner street, Park street to Water street. Measurements and levels on edgestone, line and grade for resetting edgestone and measurements of edgestone, gutter, driveway, crossing and brick sidewalk repaving.

Main street, northerly side, at and near Beacham street. Measurement of edgestone, driveway and brick sidewalk repaving.

Marion street, Bunker Hill street to Princeton street. Measurement of edgestone, gutter, driveway and brick sidewalk repaving.

Mill street, Essex street to Rutherford avenue. Measurements and levels on edgestone, line and grade for resetting edgestone and measurement of new roadway paving.

Miller street, Lawrence street to Rutherford avenue. Measurements and levels on edgestone, line and grade for resetting edgestone and measurement of edgestone, gutter, driveway and brick sidewalk repaving.

Perkins street, between Cambridge street and Somerville line. Measurements and levels for profile of edgestone, line and grade for resetting edgestone and measurement of edgestone, gutter, driveway, crossing, brick sidewalk repaving and new roadway paving.

Perkins street, Somerville line to B. and M. R.R. Plan and profile of edgestone for grade and line and grade for edgestone.

Princeton street, Lexington street to Tufts street. Measurement of edgestone, crossing, gutter and brick sidewalk repaving.

Rutherford avenue, between Chapman street and Dunstable street. Measurements of block stone roadway.

West street, between Beacham street and Alford street. Measurement of edgestone, gutter, driveway and brick sidewalk repaving.

ROXBURY.

Adams street, Orchard street to No. 23. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Albany street, Mall street to Dearborn street. Measurement of roadway paving.

Ambrose street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Auburn street, easterly corner Mt. Vernon street. Measurement of edgestone, gutter and sidewalk paving.

Batchelder street, between Marshfield street and Burrell street. Measurement of edgestone, gutter and sidewalk paving.

Bay State road, northerly side, between Sherborn street and Deerfield street. Grade of edgestone tested, line and grade for edgestone, grade of edgestone tested and measurement of sidewalk paving.

Bay State road, northerly side, near Granby street. Grade of edgestone tested and measurement of sidewalk paving.

Blue Hill avenue, No. 225. Line and grade of edgestone tested and measurement of sidewalk paving.

Blue Hill avenue, easterly corner Quincy street. Line and grade for edgestone.

Blue Hill avenue, northerly corner Quincy street. Line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Blue Hill avenue, easterly corner Grove street. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Blue Hill avenue, westerly corner Otisfield street. Grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Blue Hill avenue, southeasterly side, Intervale street to Brunswick street. Line and grade of edgestone tested, line and grade of edgestone and measurement of sidewalk paving.

Blue Hill avenue, easterly corner Devon street. Line and grade for edgestone, grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Blue Hill avenue, northwesterly side, near Schuyler street. Line and grade of edgestone tested and measurement of sidewalk paving.

Bickford street, at Plant's factory. Measurement of sidewalk paving.

Bower street, westerly corner Humboldt avenue. Grade of edgestone tested, grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Bower street, measurement of edgestone, gutter, crosswalk, and sidewalk paving.

Burke street, line and grade for edgestone and measurement of edgestone, gutter paving.

Burney street, westerly corner Tremont street. Line and grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Burrell street, northerly corner Clifton street. Measurement of edgestone, gutter and sidewalk paving.

Burrell street, at Marshfield street. Measurement of edgestone, gutter and sidewalk paving.

Calumet street, Nos. 34 and 36. Measurement of edgestone.

Camden street, southwesterly side Tremont street to Northfield street. Line and grade for edgestone.

Camden street, at Roosevelt street. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Cedar street, Nos. 2 to 46. Measurement of edgestone, gutter and sidewalk paving.

Cedar street, northerly corner Highland street. Measurement of edgestone, gutter and sidewalk paving.

Centre street, westerly corner Penryth street. Line and grade of edgestone tested and measurement of sidewalk paving.

Centre street, easterly corner Columbus avenue. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Chadwick street, Nos. 3 to 19. Measurement of edgestone, gutter and sidewalk paving.

Chestnut avenue, easterly corner Mozart street. Measurement of sidewalk paving.

Circuit street, No. 71 to Washington street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Clifton street, northerly corner Burrell street. Measurement of edgestone, gutter and sidewalk paving.

Clifton street, southwesterly side, Albion street to Cottage street. Measurement of edgestone, gutter and sidewalk paving.

Columbus avenue, northerly corner West Walnut park. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested, grade for inside of sidewalk paving and measurement of edgestone, gutter and sidewalk paving.

Conant street, Phillips street to Huntington avenue. Grade for edgestone and measurement of edgestone, gutter, crosswalk and sidewalk paving.

Copeland street, easterly corner Waverly street. Measurement of sidewalk paving.

Cunard street, Nos. 10–12. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Cunard street, Nos. 33–35. Grade of edgestone tested.

Dale street, Nos. 111–113. Measurement of sidewalk paving.

Day street, northeasterly corner Round Hill street. Line and grade of edgestone tested and measurement of edgestone and gutter paving.

Dearborn street, easterly side, Ambrose street to Eustis street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Downing street, Nos. 20 and 23. Measurement of sidewalk paving.

Dudley street, No. 90 to Guild row. Measurement of edgestone, gutter and sidewalk paving.

East Lenox street, northeasterly side, Harrison avenue to Reed street. Measurement for assessment.

East Lenox street, southerly corner Harrison avenue. Measurement for assessment.

Edgewood street, measurement of edgestone, gutter, crosswalk and sidewalk paving.

Elm Hill avenue, Crawford street to Howland street. Plan and profile for grade.

Elm Hill avenue, westerly corner Howland street. Measurement of sidewalk paving and measurement for assessment.

Fellows street, westerly corner East Lenox street. Grade of edgestone tested and grade for edgestone.

Fellows street, easterly corner Hunneman street. Line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Fellows street, northerly corner Hunneman street. Line and grade for edgestone and measurement of edgestone and gutter paving.

Flagg street, Nos. 18–22. Measurement for assessment.

Forest street, Nos. 2–4. Measurement of edgestone, gutter and sidewalk paving.

George street, northerly corner Langdon street. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

George street, No. 135. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Guild row, northwesterly side. Measurement of edgestone, gutter and sidewalk paving.

Hampden street, Nos. 198–202. Measurement of edgestone, gutter and sidewalk paving.

Harrison avenue, southeasterly side, Webber street to Hunneman street. Measurement of edgestone and gutter paving.

Harrison avenue, Nos. 1114–1116. Measurement of sidewalk paving.

Harrison avenue, Nos. 1174–1180. Measurement of sidewalk paving.

Hemenway street, westerly side, opposite Batavia street. Grade for edgestone.

Highland street, Nos. 67–85. Measurement of edgestone, gutter and sidewalk paving.

Hillside street, Nos. 176–178. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Holborn street, measurement of sidewalk paving.

Homestead street, No. 95. Line and grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, Munroe street to Bower street. Plan and profile of edgestone for revised grade.

Humboldt avenue, westerly corner Bower street. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, Nos. 51–57. Line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Humboldt avenue, No. 69. Grade of edgestone tested and measurement of sidewalk paving.

Humboldt avenue, southeasterly corner Townsend street. Grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Hunneman street, northerly corner Fellows street. Line and grade for edgestone and measurement of edgestone and gutter paving.

Hunneman street, easterly corner Fellows street. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Hunneman street, southerly corner Fellows street. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Hunneman street, northerly corner Albany street. Line and grade of edgestone tested and measurement of edgestone and sidewalk paving.

Ingleside street, Nos. 13–15. Line and grade of edgestone tested and measurement of sidewalk paving.

Ingleside street, No. 8. Line and grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.

Kent street, at Vernon street. Measurement of gutter paving.

Kent street, northerly corner Roxbury street. Measurement of edgestone, gutter and sidewalk paving.

Kingsbury street, easterly corner Washington street. Line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Lamont street, Nos. 8 and 11. Measurement of sidewalk paving.

Lawrence avenue, southerly side, corner Blue Hill avenue. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Mall street, at Albany street. Measurement of crosswalk and gutter paving.

Marcella street, Nos. 14–20. Measurement of edgestone, gutter and sidewalk paving.

Marshfield street, Nos. 30–34 and 38. Measurement of edgestone, gutter and sidewalk paving.

Massachusetts avenue, westerly side, north of Norway street. Grade of edgestone tested, line and grade for edgestone and line and grade of edgestone tested.

Massachusetts avenue, northwesterly corner Norway street. Grade of edgestone tested, line and grade for edgestone, grade of edgestone tested and measurement of sidewalk paving.

Maywood street, No. 50. Line and grade for edgestone and line and grade of edgestone tested.

Minden street, northerly side, between Walden and Schiller streets. Line and grade for edgestone.

Minden street, No. 131. Line and grade for edgestone and measurement of edgestone, gutter and crosswalk paving.

Montrose street, No. 26. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Mountfort street, northerly side, near Beacon street. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Mountfort street, Nos. 49–51. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Mt. Pleasant avenue, Nos. 10–12. Measurement of edgestone, gutter and sidewalk paving.

Mt. Pleasant avenue, Nos. 114 and 126. Line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Mozart street, easterly corner Chestnut avenue. Measurement of sidewalk paving.

Munroe street, No. 80. Line and grade for edgestone, line and grade of edgestone tested and measurement of edgestone, gutter and sidewalk paving.

Newbury street, northeasterly corner Charles Gate East. Line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone and gutter paving.

Norfolk avenue, between Magazine street and Gerard street. Plan and profile of edgestone for grade.

Norfolk avenue, Magazine street to Shirley street. Line and grade for edgestone, and measurement of edgestone, roadway, approximate sidewalk grading and sidewalk paving.

Norfolk avenue, No. 31. Measurement of edgestone, gutter and sidewalk paving.

Northampton street, at Roosevelt street. Line and grade for edgestone, line and grade of edgestone tested, and measurement of sidewalk paving.

Norway street, northwesterly corner Massachusetts avenue. Line and grade for edgestone, line and grade of edgestone tested and measurement of sidewalk paving.

Otisfield street, westerly side, corner Blue Hill avenue. Grade of edgestone tested and grade for edgestone.

Paul Gore street, No. 53. Measurement of edgestone, gutter and sidewalk paving.

Quincy street, northerly corner Blue Hill avenue. Line and grade for edgestone, line and grade of edgestone tested, and measuremunt of edgestone, gutter and sidewalk paving.

Quincy street, easterly corner Blue Hill avenue. Line and grade for edgestone.

Reed street, easterly corner East Lenox street. Measurement for assessment.

Round Hill street, easterly corner Day street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Roxbury street, westerly corner Guild row. Measurement of edgestone, gutter and sidewalk paving.

Ruthven street, Nos. 152 and 156. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Ruthven street, Nos. 176 and 182. Measurement of sidewalk paving.

Savin street, No. 57. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Sherman street, Bower street to Ottawa street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Shirley street, at George street. Measurement of crosswalk and roadway paving.

Terry street, westerly corner Tremont street. Measurement of edgestone, gutter and sidewalk paving.

Thorndike street, northerly side, near Washington street. Line and grade for edgestone, line and grade of edgestone tested twice, and measurement of edgestone, gutter and sidewalk paving.

Thornton street, westerly corner Valentine street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Townsend street, No. 30, northeasterly side, to Codman park. Measurement of gutter paving.

Townsend street, easterly corner Humboldt avenue. Line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Tremont street, northerly side, corner Riverside street. Grade of edgestone tested, and measurement of sidewalk paving.

Tremont street, railroad to Merton place. Measurement of edgestone, gutter and sidewalk paving.

Tremont street, westerly corner Burney street. Line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Turner street, at bend. Line and grade for edgestone.

Vernon street, Washington street to Cabot street. Line and grade for edgestone, and measurement of edgestone, gutter, crosswalk and sidewalk paving.

Vernon street, Tremont street to Cabot street. Measurement of edgestone, gutter, crosswalk and sidewalk paving.

Wabeno street, between Wabon street and Wyoming street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Wabeno street, No. 5. Line and grade of edgestone tested, and measurement of sidewalk paving.

Wabeno street, easterly corner Wabon street. Line and grade of edgestone tested, and measurement of sidewalk paving.

Wabeno street, opposite Wabon street. Line and grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Wait street, at Huntington avenue. Grade for edgestone, and measurement of edgestone, gutter, crosswalk and sidewalk paving.

Warren street, opposite Holborn street. Grade for edgestone, and measurement of edgestone, gutter and sidewalk paving.

Warren street, at Georgia street. Measurement of crosswalk and roadway paving.

Waverley street, easterly corner Copeland street. Measurement of sidewalk paving.

Washington street, northwesterly side, William street to Ball street. Measurement of edgestone, roadway, crosswalk and sidewalk paving.

Washington street, northerly corner Vernon street. Measurement of sidewalk paving.

Washington street, southerly side, corner Kingsbury street. Line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Waumbeck street, northerly corner Warren street. Measurement for assessment.

Waumbeck street, No. 41. Line and grade of edgestone tested, and measurement of sidewalk paving.

Waumbeck street, northeasterly side, near Humboldt avenue. Line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Webber street, plan and profile of edgestone for grade and measurement of edgestone, gutter and sidewalk paving.

Webber street, Nos. 25 and 27. Grade of edgestone tested, line and grade for edgestone, line and grade of edgestone tested, and measurement of edgestone, gutter and sidewalk paving.

Wensley street. Grade for grading, and approximate estimate of cutting.

West Walnut park, northerly corner Columbus avenue. Line and grade for edgestone, line and grade of edgestone tested, and grade for inside of sidewalk, and measurement of edgestone and gutter paving.

Wigglesworth street, Tremont street to Huntington avenue. Line and grade for edgestone.

Wyman street, Nos. 34 and 36. Line and grade of edgestone, tested, and measurement of sidewalk paving.

Wyman street, No. 38. Grade of edgestone tested, and measurement of sidewalk paving.

Wyman street, Nos. 63 to 71. Measurement of edgestone, gutter and sidewalk paving.

Wyman street, Nos. 72 to 76. Measurement of edgestone, gutter and sidewalk paving.

DORCHESTER.

Abbot street, No. 28. Line and grade for edgestone, line and grade tested, and measurement of sidewalk paving.

Adams street, No. 293. Edgestone tested and artificial stone measured.

Alban street, No. 71. Measurement of artificial stone.

Alban street, No. 93. Edgestone tested and measurement of artificial stone.

Ashmont street, at Washington street. Line and grade for crossings.

Athelwold street, No. 6. Measurement of artificial stone.

Athelwold street, Nos. 29, 31, 33. Measurement of artificial stone.

Athelwold street, at southeasterly corner Merlin street. Measurement of artificial stone.

Bakersfield street, between Stoughton street and Trescott street. Line and grade for edgestone.

Bakersfield street, No. 16. Line and grade for edgestone.

Batchelder street, easterly side, Burrell street to Marshfield street. Line and grade for edgestone.

Bellevue street and Quincy street, at northerly corner. Line and grade for edgestone and measurement of paving.

Bellevue street, No. 17. Line and grade for edgestone, line and grade tested, and measurement of artificial stone.

Bellevue street, at Stanley street. Line and grade for edgestone, and measurement of edgestone and gutter paving.

Bernard street. Measurement of artificial stone.

Blue Hill avenue, southeasterly corner Walk Hill street. Line and grade for construction.

Bowdoin street, No. 101. Line and grade of edgestone tested and measurement of artificial stone.

Bowdoin street, at Oakley street. Line and grade for edgestone.

Bradlee street, Nos. 29–31. Line and grade for edgestone, edgestone tested and measurement of paving.

Brookford street, at corner Rand street. Line and grade for edgestone.

Burrell street, at northerly corner Clifton street. Line and grade for edgestone.

Burrell street, Nos. 77, 80, 83, 87, 89. Line and grade for edgestone.

Burrell street, at corner of Batchelder street. Line and grade for edgestone and measurement of paving.

Capen street, between Norfolk street and Evans street. Line and grade for construction.

Carlisle street, at Centre street. Line and grade for edgestone and measurement of paving.

Centre street, No. 5. Line and grade for edgestone and measurement of paving.

Centre street, No. 74. Line and grade for edgestone and measurement of paving.

Centre street, Nos. 90, 92, 94. Line and grade for edgestone and measurement of paving.

Centre street, No. 98. Line and grade for edgestone and measurement of paving.

Centre street, Nos. 102–104. Line and grade for edgestone and measurement of paving.

Centre street, between Centre avenue and Carlisle street. Line and grade for construction and measurement of gutter paving.

Charles street, at Greenbier street. Edgestone tested.

Devon street, northeasterly corner Blue Hill avenue. Line and grade for edgestone.

Dewey street, southerly side, at Howard avenue. Line and grade for edgestone, line and grade tested and measurement of artificial stone.

Dewey street, No. 33. Edgestone tested and measurement of artificial stone.

Dorchester avenue, No. 750. Edgestone tested and measurement of artificial stone.

Dorchester avenue, No. 835. Edgestone tested and measurement of artificial stone.

Dorchester avenue, corner of Park street. Edgestone tested and measurement of artificial stone.

Dudley street, Nos. 772–774. Edgestone tested and measurement of artificial stone.

Duncan street, No. 51. Line and grade for edgestone.

East Cottage street, Nos. 272, 274, 276. Line and grade for edgestone and measurement of paving.

East Cottage street, northerly side, near Dorchester avenue. Line and grade for edgestone and measurement of paving.

Edson street, southwesterly corner of Norfolk street. Line and grade for edgestone, line and grade tested and measurement of artificial stone, edgestone and gutter paving.

Edson street, Nos. 5–11. Line and grade for edgestone and measurement of paving.

Edson street, Nos. 36–58. Line and grade for edgestone and measurement of paving.

Elmo street, between Blue Hill avenue and Erie street. Line and grade for edgestone and measurement of paving.

Faulkner street, No. 27. Edgestone tested and measurement of artificial stone.

Geneva avenue, at Bloomfield street. Edgestone tested.

Hancock street, Nos. 173–175. Line and grade for edgestone and measurement of paving.

Hartford street, Nos. 34, 36, 38. Edgestone tested and measurement of artificial stone.

Hartford street, at corner of Chamblet street. Edgestone tested and measurement of artificial stone.

Harvard street, at Gawain street. Line and grade for edgestone.

King street, southerly side, near Train street. Line and grade for edgestone, line and grade tested and edgestone, artificial stone and gutter paving measured.

Locust street, between Dorchester avenue and Buttonwood street. Line and grade for edgestone.

Magnolia street, No. 89. Measurement of sidewalk paving.

Magnolia street, Nos. 104–106. Line and grade for edgestone and measurement of sidewalk paving.

Marshfield street, No. 3. Measurement of sidewalk paving.

Marshfield street, No. 5. Edgestone tested and measurement of sidewalk paving.

Marshfield street, Nos. 30 to 34. Line and grade for edgestone.

McLellan street, No. 63. Edgestone tested and measurement of artificial stone.

McLellan street, No. 103. Edgestone tested and measurement of artificial stone.

Melville avenue, Nos. 101–103. Line and grade for edgestone, edgestone tested and measurement of edgestone, artificial stone, gutter and sidewalk paving.

Milton avenue, corner of Norfolk street. Line and grade for edgestone.

Milton avenue, No. 15. Line and grade for edgestone.

Mt. Vernon street, measurement of gutter paving.

Nightingale street, measurement of sidewalk paving.

Norfolk street, corner of Milton avenue. Line and grade for edgestone.

Norfolk street, corner of Edson street. Line and grade for edgestone, and edgestone, artificial stone and gutter paving measured.

Park street, corner of Kilton street. Line and grade for edgestone, edgestone tested and measurement of artificial stone.
Park street, corner Dorchester avenue. Measurement artificial stone.
Park street, from Geneva avenue to Shawmut Branch Railroad. Measurement of edgestone and gutter paving.
Pleasant street, from East Cottage street to Victoria street. Levels for profile to fix grade of sidewalk.
Pleasant street, at corner Willis street. Line and grade for sidewalk.
Pleasant street, corner Mayfield street. Edgestone tested.
Pleasant street, Nos. 24 to 30. Line and grade for artificial stone and measurement of artificial stone.
Pleasant street, No. 66. Edgestone tested and measurement of artificial stone.
Pleasant street, Nos. 90 to 100. Line and grade for sidewalk and measurement of artificial stone.
Quincy street, No. 152. Line and grade for edgestone.
Quincy street, corner Columbia road. Line and grade for edgestone.
Richfield street, No. 60. Edgestone tested and measurement of artificial stone.
Rosedale street, No. 38. Line and grade for edgestone, edgestone tested and measurement of artificial stone.
Stanwood street, at Normandy street. Line and grade for edgestone.
Stanwood street, Nos. 8 to 22. Edgestone tested and measurement of artificial stone.
Stanwood street, Nos. 40 to 44. Edgestone tested and measurement of artificial stone.
Stanwood street, No. 120. Line and grade for edgestone, edgestone tested and measurement of edgestone, artificial stone and gutter paving.
Savin Hill avenue, Nos. 153 to 159. Line and grade for edgestone.
Stoughton street, opposite the cemetery. Measurement of gutter paving.
Stoughton street, at Sumner street. Measurement of gutter paving.
Talbot avenue, No. 447. Measurement of artificial stone.
Virginia street, edgestone tested and measurement of artificial stone.
Wolcott street, No. 16. Edgestone tested and measurement artificial stone.
Waldeck street, opposite Tremlett street. Line for edgestone.
Wales street, No. 25. Edgestone tested and measurement artificial stone.
Wales street, No. 37. Edgestone tested and measurement of artificial stone.
Walk Hill street, from Blue Hill avenue to Norfolk street. Levels for profile for grade, and line and grade for construction.

Washington street, at school street. Edgestone tested and measurement artificial stone.
Washington street, at New England Railroad. Edgestone tested and measurement artificial stone.
Washington street, No. 394. Edgestone tested and measurement of artificial stone.
Westville street, Nos. 104–106. Edgestone tested and measurement artificial stone.
Westville street, No. 27. Measurement of gutter paving.
Westville street, No. 72. Line and grade for edgestone.
Winter street, at East street. Line and grade for edgestone.

WEST ROXBURY.

Adelaide street, westerly corner Boylston street. Line and grade for edgestone, measurement of edgestone and gutter paving, line and grade of artificial stone sidewalk tested, and measurement of artificial stone sidewalk.
Ashland street, at Charles Sumner School. Measurement of edgestone and gutter paving.
Boylston street, Nos. 20, 22, 23, 25, 26, 27, 28, 30. Line and grade for edgestone, measurement of edgestone and gutter paving, artificial stone sidewalk tested for line and grade and measurement artificial stone sidewalk.
Boylston street, Nos. 16 and 19. Line and grade for edgestone and measurement edgestone and gutter paving.
Boylston avenue, at Stony brook. Profile for grade and grade for bridge construction.
Boynton street, Nos. 20 and 22. Line and grade for edgestone, measurement of edgestone and gutter paving, artificial stone sidewalk tested for line and grade and measurement artificial stone sidewalk.
Brewer street, Nos. 6 to 9. Measurement of sidewalk paving.
Brookfield street, Nos. 9 to 11. Line and grade of edgestone tested, artificial stone sidewalk tested for line and grade and measurement artificial stone sidewalk.
Burroughs street, at Centre street. Measurement concrete sidewalk paving.
Burroughs street, Nos. 24 and 49. Measurement sidewalk paving.
Carolina avenue, northwesterly corner Call street. Line and grade for edgestone and measurement of edgestone and gutter paving.
Centre street, Nos. 657 to 689. Measurement sidewalk paving.
Centre street, No. 769 to Eliot street. Measurement sidewalk paving.
Centre street, Corey street to Mt. Vernon street. Measurement of sidewalk paving for assessment.
Chestnut avenue, from Chestnut place to Green street. Measurement gutter paving.
Cornell street, from Poplar street, 1,000 feet west. Line and grade for construction.

Cranston street, from No. 33, east and north to Sheridan street. Line and grade for edgestone and measurement of edgestone and gutter paving.

Eliot street, No. 4. Measurement sidewalk paving.

Elm street, measurement of edgestone, gutter and sidewalk paving.

Everett street, measurement sidewalk paving.

Forest Hills street, at Montebello road. Line and grade for artificial stone sidewalk.

Gould street, near Hamilton street. Line and grade for filling.

Holbrook street, measurement sidewalk paving.

Hyde Park avenue, northeasterly corner Tower street. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Jess street, measurement of edgestone and gutter paving.

Keyes street, No. 14. Line and grade for edgestone, measurement of edgestone and gutter paving and artificial stone sidewalk tested and measured.

Kittredge street, Nos. 5 to 57. Measurement gutter paving.

Lamartine street, Nos. 192–194. Line and grade for edgestone, measurement of edgestone and gutter paving and artificial stone sidewalk tested and measured.

Myrtle street, Nos. 17 to 23. Measurement of sidewalk paving.

Paul Gore street, No. 53. Line and grade for edgestone.

Perkins street, between Zamora street and Catalpa street. Measurement of edgestone and gutter paving.

Pond street, between Centre street and Jamaicaway. Measurement of edgestone, gutter and sidewalk paving.

Poplar street, Nos. 9 to 37. Line and grade for edgestone and measurement of edgestone, gutter and sidewalk paving.

Porter street, measurement of edgestone, gutter and crosswalk paving.

Sheridan street, measurement of edgestone and gutter paving.

South street, junction of Centre street. Measurement of sidewalk paving.

St. Rose street. Line and grade for construction.

Washington street, northeast corner of School street. Artificial stone sidewalk tested and measured.

Washington street, No. 3144. Line and grade for edgestone and measurement of edgestone and gutter paving.

Williams street, from Washington street to N. Y., N. H. & H. R.R. Line and grade for filling.

Wyman street, Nos. 28 to 34. Measurement of sidewalk paving.

BRIGHTON.

Brighton avenue, from Chester street to Linden street. Line and grade for construction and measurement of edgestone, gutter and sidewalk paving.

Chestnut Hill avenue, at Chiswick road. Line and grade for sidewalk.

Commonwealth avenue, opposite Gorham street. Line and grade for artificial stone sidewalk.

Commonwealth avenue, between Naples road and Brighton avenue. Line and grade for construction.

Dustin street, from Cambridge street to Cypress road. Line and grade for construction and measurement of gutter paving.

Etna street, from North Beacon street to Spring street. Line and grade for filling.

Franklin street, from Lincoln street to Fern street. Line and grade for construction and measurement of edgestone, gutter and sidewalk paving.

Franklin street, from B. & A. R.R. to Lincoln street. Measurement of gutter paving.

Franklin street, Nos. 28–30. Measurement of edgestone, gutter and sidewalk paving.

Gardner street, No. 14. Line and grade for edgestone and measurement of edgestone, gutter and artificial stone sidewalk.

Gardner street, from Chester street to No. 76. Line and grade for artificial stone sidewalk, line and grade tested and measurement artificial stone sidewalk.

Henshaw street, Nos. 23–25. Line and grade for edgestone, measurement of edgestone, gutter and artificial stone sidewalk and line and grade tested.

Menlo street, Nos. 3 to 11 and 6 to 10. Line and grade of edgestone tested, measurement of artificial stone sidewalk and line and grade tested.

Sutherland road, from Beacon street to Orkney road. Line and grade for cutting.

Washington street, at Newton line. Line and grade for artificial stone sidewalk, line and grade tested and sidewalk measured.

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JANUARY 31, 1899.

Indexed.	General Head under which Classified.	Number of Plans.
Vol. A.	Plans of estates (lithographed)	221
" B.	" " " "	189
" C.	" " " " in Brighton	36
" D.	" " " " in West Roxbury	69
" E.	" " " "	17
" F.	" " " "	2
" 1 to 13[1]	" " " widenings, etc.	664
" 14, 15, 16, and 17	" " "	505
" 18	School-houses and miscellaneous plans	95
" 19	Plans from actual survey in City Proper	130
" 20	Profiles of City Proper and Boston Harbor, and ancient plans	91
" 21	Plans and profiles of streets in East Boston, 1849	45
" 22	" " " " " " " " 1868	45
" 23	" " " " " "South Boston, 1848	27
" 24	" " " " " " " " 1860	39
" 25	" " " " " at South End	21
" 26	" " " " " in Church and Suffolk street Districts	38
" 27	" " " " various streets	16
" 28	Miscellaneous plans, estates, etc.	79
" 29	" " " " "	69
" 30	" " " " "	97
" 31	Official plans from 1851 to 1854	103
" 32	Plans of estates	112
" 33	" " "	131
" 34	" " "	108
" 35	" " "	256
" 36	" " "	118
" 37	" " "	53
" 38 " 39	Hale's plans of the streets in Boston, 1819	176
" 40	Plans of estates	66
" 41	" " "	494
" 42	Ancient plans of estates in South Boston, etc.	46
" 43	Sectional plans of city lands at South End	24
" 44	Plans of estates in Roxbury	77
	Carried forward	4,259

[1] Vol. 8 is a set of Architects' plans, and has been transferred to the Public Buildings Department.

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JANUARY 31, 1899. — *Continued.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	4,259
Vol. 45	Plans of estates in Roxbury	70
" 46	" " " " "	80
" 47	" " widenings in Roxbury	50
" 48	" " " etc., in Roxbury	140
" 49	" " " " " "	73
" 50	Third Parish and Grammar School lands in Roxbury	57
" 51	Plans of widenings in Roxbury	59
" 52	" " city lands and widenings in Roxbury	92
" 53	Profiles of streets in Roxbury	76
" 54	" " " " "	87
" 55	" " " " "	42
" 56	" " " " "	56
" 57	Plans of widenings in Brighton	25
" 58	" " estates in Brighton	115
" 59	" " " " "	74
" 60	" " city property, etc., in Brighton	18
" 61	" " widenings in West Roxbury	75
" 62	" " " " " "	44
" 63	Profiles of streets	58
" 64	Plans of city property, etc., in West Roxbury	27
" 65	" " estates, etc., in West Roxbury	199
" 66	" " " " " " "	217
" 67	" " " " " " "	73
" 68	" " " " " " " and Brighton	152
" 69	" " " "	140
" 70	" " " "	185
" 71 to 82	Charlestown plans, in bound volumes, showing street-widenings and estates	626
" 83	Charlestown street surveys	229
" 84	Miscellaneous plans	106
" 85	Plans of estates in Roxbury	485
" 86	" " " " "	18
" 87	" " " etc.	169
" 88	" " " "	32
	Carried forward	8,208

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JANUARY 31, 1899. — *Continued.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	8,208
Vol. 89	Plans of estates, etc.	140
" 90	" " " "	10
" 91	Insurance volumes	25
" 92	" "	31
" 93	" "	28
" 94	" "	27
" 95	Dorchester surveys	65
" 96	" "	61
" 97	" "	63
" 98	Plans of estates, etc.	99
" 99	" " " " in Dorchester	521
" 100	Sectional Plans, City Proper, pipe locations	12
" 101	" " South Boston, west of G street	24
" 102	" " " " east " " "	19
" 103	" " East " southeast of Bremen st.,	27
" 104	" " " " northwest " " "	27
" 105	Miscellaneous Plans	7
" 106	Tracings of plans and profiles	125
" 107	" " " " "	152
" 108	" " " " "	137
" 109	" " " " "	215
" 110	" " " " "	267
" 111	Assessor's Plans, 1, Roxbury and West Roxbury	59
" 112	" " 2, Dorchester and Brighton	24
" 113	" " 3, City Proper	81
" 114	Assessor's Plans, 4, South Bay, Harbor and Charlestown	49
" 115	Assessor's Plans, 5, East Boston	72
" 116	" " 6A, South Boston	129
" 117	" " 6B, " "	137
" 118	" " 7A, Back Bay	127
" 119	" " 8A, Roxbury	149
" 120	" " 8B, "	139
„ 121	" " 9A, Dorchester	149
	Carried forward	11,405

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JANUARY 31, 1899.— *Continued.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	11,405
Vol. 122	Assessor's Plans, 9B, Dorchester	162
" 123	" " 10A, West Roxbury	100
" 124	" " 10B, " "	127
" 125	" " 11A, Brighton	112
" 126	Hale's Street Maps of Boston, Whitmore Reproduction,	144
" 127	Sectional Plans, City Proper, Boston Gas Light Co.	37
" 128	Public Lands belonging to Town of Dorchester	15
" 129	Copies of plans filed with Town of Dorchester previous to annexation	65
In Drawer A	Maps of Boston, etc.	100
" Cases CC	Miscellananeous rolled plans	724
" Drawer E	Plans from surveys in City Proper	567
" " F	Plans and profiles from surveys in City Proper and Roxbury	655
" " G	South Boston plans and profiles	329
" " H	East Boston plans and profiles	132
" " L	Official plans, profiles, etc.	3,092
" " M	Copies of plans by other surveyors	322
" " N	Plans of city lands	154
" Case T	Miscellaneous rolled tracings	459
In Drawers	Tracings of plans and profiles	152
Vol. I. to LXV	Copies of official plans indexed in Vol. 31 and Drawer L,	2,683
	Maps, etc., in bound volumes	1,450
	Miscellaneous plans of the Back Bay Commission in portfolio	15
	Hanging plans	23
	Plans in progress, City Proper	55
	" " " South Boston	39
	" " " East Boston	39
	" " " Roxbury	86
	" " " Dorchester	159
	" " " West Roxbury	116
	" " " Brighton	78
	" " " Charlestown	10
	Roxbury sectional plans	163
	Carried forward	23,769

PLANS

IN SURVEYING DIVISION, ENGINEERING DEPARTMENT, JANUARY 31, 1899. — *Concluded.*

Indexed.	General Head under which Classified.	Number of Plans.
	Brought forward	23,769
	West Roxbury sectional plans	83
	Sectional plans filed under Board of Survey Act	381
	Plans filed by the Boston Transit Commission	14
	" " " " Boston Terminal Company	1
	Indexed plans of Dorchester	2,476
	Sectional " " "	232
	Miscellaneous plots and plans of Dorchester	530
	Blue prints of official and progress plans	615
	Blue prints change of Location and Grade, N. Y., N. H. & H. R.R., at South End	26
	Blue prints, change of Grade, Providence Division, Old Colony R.R.	48
	Blue prints, change of Grade, West Roxbury Branch	16
	Plans of proposed streets submitted by owners and approved by the Board of Street Commissioners:	
	City Proper	1
	East Boston	12
	South Boston	4
	Roxbury	55
	Dorchester	181
	Charlestown	1
	West Roxbury	99
	Brighton	44
	Plans of proposed streets submitted by owners for the approval of the Board of Street Commissioners now under consideration:	
	Roxbury	23
	Dorchester	71
	West Roxbury	38
	Brighton	34
		28,754

There are also 4,536 lithographed plans in the office at Old Court House not included in the foregoing list, viz.:

Lithographed maps of Dorchester, made in 1869	38
" " " " " 1880	145
" " " West Roxbury, made in 1873	31
" " " Brighton, made in 1873	12
" " " Fort Hill, made in 1866–69	83
" " " Church-st. district, made in 1868	185
" " " Washington-st. widening (parts 1, 2, 3), made in 1860	1,193
" " " Washington-st. extension, made in 1869	326
" " " North street, made in 1859	44
" " " Stony brook, drainage area	10
" " " Boston, made in 1866–67	109
" " " Boston, made in 1888	75
" " " Suffolk-st. district, made in 1869	11
" " " South Boston, made in 1880	70
" " " Roxbury, made in 1880	109
" " " Burnt district	73
" " " Mt. Hope Cemetery	28
" " " Winthrop Farm	49
" " " Hanover avenue	44
" " " Muddy river	44
" " " Pemberton square, Court-House site	215
" " " East Newton street, lots on, sold by auction, made in 1888	42
" " " Public lands in South Boston, sold by auction, made in 1885	82
" " " Public lands in South Boston, sold by auction, made in 1888	8
" " " Boylston street, old Public Library lot	17
" " " Public lands in South Boston, sold by auction, made in 1882	136
" " " Boston Directory map, made in 1886	60
" " " Boston, scale 1,600 feet to an inch, made in 1890	250
" " " Boston, scale 800 feet to an inch, made in 1891, colored plans	5
" " " Boston proper, scale 500 feet to an inch, made in 1894	13
" " " Exhibit No. 1, City Surveyor's Report, 1893	110
" " " Exhibit No. 2, City Surveyor's Report, 1893	115
" " " Exhibit No. 3, City Surveyor's Report, 1893	114
" " " High street, public lands sold by auction	16
" " " Beacon Hill, State House site	41
" " " Harrison avenue, Savage School-house lot, auction plan	57
" " " Boston proper, showing changes in street and wharf lines from 1795 to 1895	576
	4,536

ARCHITECT DIVISION.

The duties of this division are to furnish to the different departments, upon application, information on all matters pertaining to the construction, alteration, or equipment of buildings, and to prepare plans and specifications and superintend the construction of the work.

It also prepares the working plans and specifications for work performed by the Repairs Division of the Public Buildings Department, and has general superintendence of the same.

The charge against other departments has in no case exceeded 2½ per cent. of the cost of the work, whereas the regular architectural commission for much of the work handled by this division, it being alteration work, would be at least 10 per cent. and in no case less than 5 per cent.

The services of the division for other departments has been in greater request during the past year than in either of the preceding years of the existence of this division.

The total cost of the division for the year has been $11,913.16, which is properly distributed as follows:

For approval of plans, specifications, contracts, etc., and changes in same	$2,500 00
For reports, sketches, and other consultation work	4,500 00
For plans, specifications and superintendence of work actually constructed	4,913 16
Total	$11,913 16
Amount charged off against other departments	2,825 96
Net cost to Engineering Department	$9,087 20

The following is a synopsis of the work performed by the division for the year ending January 31, 1899:

Plans and contracts have been approved by the Consulting Architect for the following buildings:

School Committee.

West Roxbury High School.
East Boston High School.

Dorchester High School.
South Boston High School.
Primary School, Baker street.
Primary School, Munroe street.
Primary School, Forest Hills.
Primary School, T. N. Hart District.
Primary School, Webster avenue.
Grammar School, Perth and Quincy streets.
Temporary Schools, Frothingham and Noble Districts.
Temporary School, Morton District.
Mechanic Arts High School, addition to.
Bowditch School, addition to.
Charles Sumner School, alterations in.

Fire Department.

Engine-house, West Roxbury.
Engine-house, Haymarket square.
Engine-house, Grove Hall.

Park Department.

Boston Yacht Club House.
South Boston Yacht Club House.
Puritan Canoe Club House.
Mosquito Fleet Yacht Club House.
Columbia Yacht Club House.

Miscellaneous.

Boston Elevated Railway Stations.
Boston Public Library, alterations in.
Chapel and Gate Lodge, Mt. Hope Cemetery.
Voting-booths, Election Commissioners.

Reports have been made on the following matters:

On amount of damage sustained by the city of Boston in consequence of the settlement under boilers at Parental School, West Roxbury.
On specifications, West Roxbury High School.
On location of boilers, Parental School, West Roxbury.
On condition of hot-water heating apparatus, Marcella-street Home.
On estimated cost of proposed alteration of Massachusetts Historical Society building, Tremont street.
On condition of heating and ventilating apparatus, Long Island Institutions buildings, Boston Harbor.

On the advisability of the erection of temporary school-houses.
On height of buildings, Copley square.
On extension of boiler-house, Boston City Hospital.
On ventilation of Mayor's office, Room 19, and Assessors' office.
On boiler facilities, Rainsford Island Institutions buildings, Boston Harbor.
On removal of pergola on building, Franklin park.
On height of Westminster Chambers building, Copley square.
On erection of temporary school-house, Parental School, West Roxbury.
On condition of heating apparatus and fire escapes at Charlestown almshouse.
On heating and ventilating apparatus, Rainsford Island Institutions buildings, Boston Harbor.
On condition of heating apparatus No. 64 Pemberton square, Boston.
On condition of heating apparatus, Old Public Library building.
On award of contract for heating Primary School, T. N. Hart District.
On the adaptability of furnace heat for school buildings.
On laundry machinery for Boston City Hospital.
On proposed alteration, second floor, City Hall.
On dispute between Park Department and Repairs Division relative to charges for work performed.
On condition of tenement houses throughout the city.
On condition of plumbing system, Long Island Institutions.
On heating and ventilating apparatus for proposed alteration of Massachusetts Historical Society Building, Tremont street.
On proposed new power plant, Long Island Institutions.
On proposed extension Charles-street Jail.
On proposed Chapel and Gate Lodge, Mount Hope Cemetery.
On heating and ventilating plans, East Boston High School.
On condition of Engine-house No. 22, Dartmouth street.

Sketch plans have been made and submitted on the following architectural problems:

For the utilization of Old Court House as a part of City Hall.
For temporary school building, Parental School, West Roxbury.

For temporary school building, Rainsford Island, Boston Harbor.
For swimming pool, Frog pond, Boston Common.
For alteration of stable, Boston City Hospital.
For proposed alteration of front of Old Court House.
For proposed alteration of old Franklin School-house.
For erection of new building, old Franklin School-house site.
For gymnasium building, Charlestown Heights.
For bath-house, Ward 18, Cabot street.
For Public Convenience Station, Boston Common.
For new building, Repairs Division, Harrison avenue.
For gymnasium building, Prince street.
For gymnasium building, East Ninth street, Ward 15.
For floats, rafts, etc., etc., for Bath Commission.
For female prison, Charles-street Jail.
For drinking fountains, Water Department.
For laundry building, Rainsford Island, Boston Harbor.
For dormitory buildings, Parental School, West Roxbury.
For fire escapes, Charlestown almshouse.
For railing, Cottage Farm bridge.
For portable seats, Boston Common.
For alteration of band stand, Boston Common.
For alteration of Engine-house No. 37.
For alteration of Chemical House No. 11, North Grove street.
For bath-house, Spring street, West Roxbury.
For womens' building, and swimming pool, South Boston Gymnasium.
For alteration of old Public Library Building.
For conservatory, Boston Common.
For branch library, East Boston.
For gymnasium building, East Boston.
For pavilion, Long Island, Boston Harbor.
For double floating bath-house, Bath Commission.

Tracings have been made for different departments; reference board designed for Municipal Lecture Committee: bird's eye perspective drawing made showing entire City Hospital plant; plans made for the Election Commissioners of all ward-rooms in the city; and counters, cupboards, lockers, etc., designed for the different departments.

The following is a statement of the work, together with the cost of the same, actually performed and superintended by this division:

Bath Commission:		
South Boston Gymnasium	$16,477 08	
Floating bath-house, Charles river,	3,500 00	
Miscellaneous floats, rafts, houses, lockers, runs, etc., etc.	34,493 82	
		$54,470 90
Election Commission:		
Ward 3, ward-room, alteration of	$1,933 17	
Miscellaneous, new booths, putting up rails, etc.	12,291 89	
		14,225 06
Engineering Department:		
Faneuil Hall Building, restoration of		72,997 00
Fire Department:		
Alterations, Engine-house No. 21	$6,572 35	
Alteration, Ladder-house No. 12	1,884 89	
		8,457 24
Hospital Department:		
Extension of boiler-house	$30,598 84	
Laundry building, plumbing, heating, engine, engine foundation, machinery	11,985 97	
Vose House, temporary supply and heating	6,142 00	
Changing mains, hospital proper, together with pipe covering	3,206 73	
Changing mains, South Department	1,243 72	
Voting booths, alteration of, for use of soldiers	1,243 10	
		54,420 36
Park Department:		
Wood Island bath-house, alterations		6,336 43
Penal Institutions Department:		
Alterations in heating system, Deer Island		614 06
Public Buildings Department:		
Alteration of Armory building for use as shop	$22,595 70	
Boiler, foundation for engine and partitions for above	1,931 18	
Electrical Construction Division, office	2,219 90	
Carried forward	$26,746 78	$211,521 05

Brought forward . . .	$26,746 78	$211,521 05
Heating, etc., Armory building .	2,623 27	
Alterations, Mayor's office . .	1,447 28	
Alterations, City Clerk's office .	5,637 92	
Alteration, Clerk of Committees room	852 92	
		37,308 17
Street Department:		
Sewer Division, alterations in office and building coal trestle and pump room, Moon Island .		5,708 35
Trustees for Children:		
Resetting boilers, Parental School .	$3,040 56	
Rainsford Island Institutions, temporary school, new toilet building, new boiler, alterations in heating system	15,545 16	
Marcella-street Home, alterations,	732 00	
		19,317 72
Trustees for Paupers:		
Plumbing alterations, Long Island,	$989 70	
Heating alterations, Charlestown almshouse	1,794 08	
		2,783 78
Water Department:		
Ice-houses, East Boston and Brookline . .		7,500 00
Miscellaneous:		
Alterations office, Tremont building,	$544 29	
Old Public Library building, alterations in heating, etc . . .	737 02	
Court House, alterations prisoners' room	3,202 04	
		4,483 35
Grand total		$288,622 42

[FROM THE CITY ENGINEER'S REPORT TO THE WATER DEPARTMENT.]

On January 1, 1898, the Metropolitan Water Board, under the provisions of chapter 488 of the Acts of 1895, made takings of the entire Boston Water Works system westward of Chestnut Hill Reservoir; of Chestnut Hill Reservoir and that part of the adjoining lands included within the road encircling the reservoir; of Chestnut Hill Pumping Station and a portion of the land easterly of the Pumping Station; of the Mystic system west of and including the Mystic Reservoir on College Hill, Medford, and a portion of the mains of the Mystic System. On the same date water from the Metropolitan System was supplied to the City of Boston, and Mystic Lake as a source of water supply was abandoned. On April 21, 1898, the Metropolitan High Service was supplied to East Boston, and the local pumping station was abandoned. On February 1, 1899, the Metropolitan Water Board began the operation of the pumping station, supplying the double high service in West Roxbury.

DISTRIBUTION.

During the past year 33.6 miles of water pipes were laid and 9.1 miles were abandoned, making a total of 689.2 miles; this total length includes mains belonging to the city of Boston only, and does not include the systems of Chelsea, Somerville and Everett, and that portion of the Boston system acquired by the Metropolitan Water Board, all of which were formerly included in the reports of the City Engineer under the heads of Cochituate and Mystic Divisions.

The changed conditions occasioned by the Metropolitan supply caused some anxiety in regard to the safety during the winter season of the large mains supplying Charlestown and of those over Warren bridge; where formerly a well defined current had existed it was thought that the present slow movement of water in the pipes might be insufficient to prevent freezing, and some of the lines were shut off and emptied during the cold weather. Daily determinations were made of the temperature of the water in all mains

where danger was supposed to exist and thermophone readings were taken in the bottoms of siphons on lines that had been emptied. These readings were plotted daily and afforded opportunity for careful study of the existing conditions. When the readings became dangerously low, means were taken to increase the circulation in the pipe in danger.

The year has been an active one, as the record of pipe laid shows; for all work done plans have been made and lines and grades have been furnished where necessary.

The Dorchester high service line was completed to Washington street, via Geneva avenue and Bowdoin street, at Columbia road, the size being reduced to 30 inches; connections were made with 24-inch and 16-inch lines in Columbia road, with a 12-inch line in Bowdoin street and with a 12-inch line in Washington street. The 36-inch pipe in Geneva avenue from Grove Hall to Columbia road was laid under contract by H. P. Nawn.

The 24-inch high service in West Roxbury was extended from Forest Hills through South street to the Arnold Arboretum, and thence through Weld street to South street, connecting with the 8-inch line in Weld street and the 16-inch in Roberts street; sufficient increase of pressure resulted from this extension to allow the Skinner Hill district to be taken off the supplementary high service.

A large amount of work was done in Columbia road; new service mains were laid on each side of the road for practically the entire distance from Blue Hill avenue to Edward Everett square; a 24-inch high service main was laid (with the exception of a gap at the New York, New Haven & Hartford Railroad) from Geneva avenue easterly; at Quincy street it reduces to 20-inch and so continues to Upham's Corner. A large portion of the 20-inch and 16-inch mains were relaid from Upham's Corner to Edward Everett square.

In Roberts street a 16-inch main was laid, designed for future extension easterly to Dorchester.

In South Boston the 20-inch low service main was carried to City Point by way of Dorchester and Third streets, giving an abundant supply of water for fire purposes in a district where the protection had been inadequate. Connections were made with the pipes in Dorchester, L, P and Q streets.

The water supply at Thompson's, Long, Rainsford's and Gallop's Islands and at Fort Warren has been unsatisfactory for several years; this fact, added to the possibility of the batteries on Long Island and Fort Warren being called upon for service against a Spanish fleet, called for prompt action, and a 16-inch pipe was laid in Ashmont street and Neponset

avenue to the Neponset river, replacing a 12-inch pipe, and a 12-inch was laid from the river to Moon Island in addition to the 6-inch in service. A connection was also made with the Quincy system on Hancock street for use in an emergency.

The most important piece of relaying was on Harrison avenue, where the old 6-inch pipe was replaced with a 12-inch from West Newton street to Massachusetts avenue and with a 16-inch from Massachusetts avenue to Vernon street.

In all 8.0 miles of old and small pipe have been relaid.

It is the practice of the Street Department to notify the different departments of the city of its intention to build or rebuild streets; in all cases the pipes, hydrants, etc., upon such streets were adjusted. This practice caused a large amount of work, particularly in the city proper.

During the year an effort has been made to abolish "dead ends" with a resulting improvement both in the domestic and fire service. One hundred and fifty Boston hydrants have been taken out. In this connection I would urgently recommend the adoption of an independent valve post hydrant with two large steamer outlets running parallel with the line of the street. Such a hydrant would prove much better adapted to the needs of the Fire Department than the type of post hydrant in service.

THE CORROSION OF PIPES BY ELECTROLYSIS.

There has been no marked change in electrical conditions in the water pipes during the past year. Serious damage from electrolysis is undoubtedly a possibility, and safety can be hoped for only through systematic and continued investigation. The protective measures employed in the past have in a measure proved effectual; yet it is very possible that more radical steps must be taken in the near future to guard against disaster. The subject has been carefully studied during the year by Messrs. Stone & Webster, by whom many observations were made throughout the city. The following is their report:

STONE & WEBSTER, ELECTRICAL EXPERTS AND ENGINEERS,
4 POST OFFICE SQUARE, BOSTON, February 1, 1899.

WILLIAM JACKSON, ESQ.,
City Engineer, Boston, Mass.:

DEAR SIR, — At your request we have made during 1898, as in previous years, electrical surveys in all parts of the city of Boston covered by the electric car tracks, in order to determine the progress of electrolytic corrosion of water pipes.

Heretofore we have relied upon readings taken between the water pipes (at fire hydrants) and the ground as the most accurate index to the locality of trouble. In 1897 we also took readings between hydrants and rails, but used only the hydrant-to-ground readings in comparing the conditions of 1897 with those of 1896. In 1898, however, we confined ourselves almost entirely to readings between hydrants and rails, as we believe them more reliable for studying the situation as a whole. For particular localities, as in the neighborhood of Freeport street power station, we took ground readings also.

In other cities we have obtained hydrant-to-rail measurements in investigations made during the year, and find the only objection to the method is that the size of the single reading is not always a criterion of the amount flowing between the points at which the measurement is made. Very reliable data can, however, be obtained if hydrant-to-rail measurements are made in connection with other readings in the same locality, taken under various conditions. The objection to the hydrant-to-ground system, formerly used, is that the readings vary with the condition of the soil and are therefore not as trustworthy for general comparison, as hydrant-to-rail readings.

In diagram I. we give the maximum value of readings taken between hydrants and rails. On this diagram we have divided the city into convenient sections, shown by the red lines. The figures in red give the average voltage throughout the various sections for 1897 and 1898. The plus readings (indicated by + sign) show that the current flows from pipes to rails, the minus readings (indicated by O) show the reverse. As might be expected, many of the readings are fluctuating, and are so indicated on the diagram by a cross within a circle. Where no number accompanies a cross or a circle the reading was less than one-quarter ($\frac{1}{4}$) of a volt. We have recorded on the diagram readings of one-quarter ($\frac{1}{4}$) of a volt and up to three-quarters ($\frac{3}{4}$) as if they were one-half ($\frac{1}{2}$) volt, and readings of three-quarters ($\frac{3}{4}$) up to one and one-quarter ($1\frac{1}{4}$) as if they were one (1) volt; and so with still higher readings; that is, we have recorded the nearest even half ($\frac{1}{2}$) volt, our purpose being to simplify the figures and make it easy to compare them, extreme accuracy being neither essential nor possible in an investigation of this kind. We have not given the readings where they were sometimes positive and sometimes negative. Readings were taken between pipes and ground in the neighborhood of the Dorchester power station (*i.e.*, on Freeport and Park

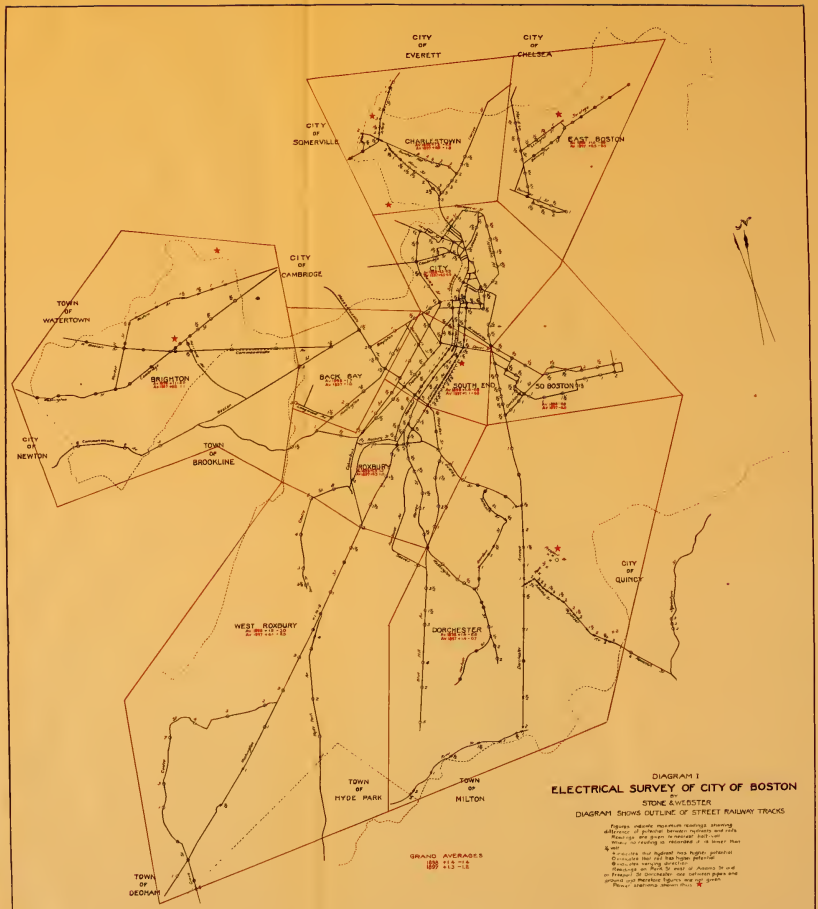


DIAGRAM I

ELECTRICAL SURVEY OF CITY OF BOSTON

STONE & WEBSTER

DIAGRAM SHOWS OUTLINE OF STREET RAILWAY TRACKS

Figures indicate maximum readings showing difference of potential between rail-bonds and rails. Readings are given to nearest half-volt. Minus (−) reading is recorded if a lower than rail.

A + reading has highest rail potential.
A − reading has lowest rail potential.
Readings on Rails to earth or Ground in red.
Readings on Rails to rails or Ground to rail in black.

Figures in parentheses (see between pages and ground and manhole figures are not given.
Power stations shown thus ★





DIAGRAM II

ELECTRICAL SURVEY OF CITY OF BOSTON

BY

STONE & WEBSTER

DIAGRAM SHOWS OUTLINE OF STREET RAILWAY TRACKS

The figures on the boundaries indicate motor-car miles operated in the year 1909 over the several Railways in Boston and the adjacent places. The arrow heads indicate the direction of flow which is sometimes in either direction as shown by the double arrow heads.

The figures on the inside of the line of boundaries indicate numbers of carsmiles operated on all portions of such lines during the year 1909. These figures are of value only as a general indication of the quality of the territory.

Power stations shown thus ★



streets). These are not given on the diagram, but only the signs indicating the direction of the flow of the current.

It will be seen that on the average the conditions for the past two years have been about the same, the difference being slightly in favor of 1897. The general averages are as follows:

Av. positive readings, 1898	+1.4	Av. negative readings, 1898	—1.4
" " " 1897	+1.3	" " " 1897	—1.2

We wish to call attention to the positive readings along Dorchester and Neponset avenues, and also along Harrison avenue, and to the negative readings along Centre street, near the Roxbury boundary, as well as along Centre street in the West Roxbury and Roslindale loop, and also on Bunker Hill street in Charlestown.

Large positive readings as shown at the former places indicate that much current is flowing off the pipes to the rails. This flow will be only increased by improving the rail-return system in a district where the readings are positive. The source of trouble will be found at some point more or less distant, where the track-return system is insufficient, so that the current leaves the tracks, seeking a path of less resistance by the pipes. Therefore, in a "positive" district the only direct remedy that can be applied is to make the piping system itself a better conductor so as to keep the current from leaving it and flowing through the earth to the rails. This remedy, however, should be considered as only a temporary expedient since it causes a large flow of current through the pipes, thus exposing them to an added danger of corrosion at the joints wherever the electrical connection is imperfect. It may, however, be resorted to in cases where the real source of trouble cannot be immediately located and where the continual passage of current from pipes to ground is causing deterioration.

With this in mind we advised bonding the water main to the return feeder in the power station on Freeport street, and also to the underground return feeder near by on Park street. These connections were made November last. Before we can be certain that similar connections should be made on Harrison avenue or the Central Power Station district, the results of the bonding in the Dorchester district will have to be carefully studied.

Large negative readings, as observed in some of the sections above mentioned, indicate that considerable current is flowing on to the water pipes. In these sections better

bonding, or a more effective return conductor of some sort, should be provided.

On Diagram II. are shown the readings taken in the outskirts of the city between hydrants of the Boston system and those of adjacent places. We spoke in our last report of the advisabilty of making a special study of this current flowing across the border of the city. We have found a greater tendency to flow off the Boston pipes in 1898 than in 1897. The detail results of the 1898 test are shown on Diagram II. We expect to give this matter more particular attention, and hope to be in a position to submit a more definite report with regard to it during the coming year.

For the purpose of investigating the general efficiency of the rail-bonding we took several readings along sections of track from 1,000 to 1,800 feet in length, and the figures given on the diagram show the fall of potential per 100 feet as computed from the data obtained. There was no indication of very defective rail-bonding thus revealed, but the readings will be of use in giving a standard for comparison on other occasions. The variations in the figures are largely due to varying numbers of cars in the different sections of the street railway system.

We reported last year that the underground return-feeder system of the Dorchester District threatened to cause trouble in the service pipes before long, and our investigations since then tend to confirm this opinion. Our attention was called on March 21 of this year to a broken service on Park street, and examination shows that electrolysis is undoubtedly the cause of the break. A section of the pipe has been returned and is kept for exhibit. The readings between this pipe and the ground were as high as $\frac{4}{10}$ of a volt, which is unusual for a ground reading.

In general, we think there is much likelihood that electrolytic corrosion is going on in the two danger districts above mentioned and to a smaller degree in one or two other places where positive readings are shown. Another place in particular to which we would call attention is on Hyde Park avenue between Walk Hill street and Forest Hills Station.

Careful watch should be kept of all localities where trouble is indicated, lest the conditions change for the worse. Occasional bursting of pipes from single leaks is not to be feared so much as the continual wasting that may go on from current escaping over large sections.

Yours very truly,

(Signed) STONE & WEBSTER.

SALT–WATER FIRE SYSTEM.

A salt-water system for fire protection was established under a special appropriation granted to the Fire Department. It consists of a 12-inch pipe, extending from Central Wharf through Central and Exchange streets, Post-office square and Congress street to Congress-street bridge, a total distance of about one mile. At Central Wharf the line divides into two 10-inch pipes, to each of which is attached a special casting, fitted with six 3½-inch outlets, with check-valves on each outlet. This design enables one or both fire-boats to connect with the pipe through lines of 3½-inch hose, varying in length from fifteen to thirty feet. A similar boat connection will be established at Congress-street bridge.

With the exception of a short exposed piece of pipe at each end of the line, the system is maintained full of water from a check-valve at Central Wharf to a similar valve at Congress-street bridge, pressure being maintained up to check-valves and to foot-valves of hydrants by means of a 1-inch pipe connecting with a tank in the Post-office building, which is fed directly from the city mains. Check-valves in this connecting pipe close when fire pressure exceeds the ordinary domestic pressure.

Six-inch relief valves are set on the main pipe to prevent the maximum pressure exceeding 200 pounds per square inch. In service, when the first hose connection has been made between the fire-boat and the end of the pipe, the former can begin to pump slowly, expelling the air from the empty end near the boat through an air-cock provided for the purpose. When the requisite number of connections have been made, the air has been driven out, and the boat is ready to respond to a signal from a hydrant to "go ahead." Hydrants are established about 300 feet apart, each gated off from the main line. The hydrant used was the Bachelder (so called from the name of the inventor and patentee, E. J. Bachelder, master mechanic of the Boston Water Department). It is a post hydrant of unusually heavy design, with three 3-inch outlets, each controlled by an independent valve. The waste is positive, and is operated by a wrench from the street surface. A hole is cored out in the side of the hydrant for an electric cable, terminating in a recess at the top, forming a signal-box, thus affording means of electrical connection in the hydrant itself, and avoiding the necessity of an independent post for that purpose.

The pipe used was cast-iron, of the general Boston Water Works pattern, with the innovation of two lead scores in the

bell. It was unusually heavy, being one inch thick, and weighing 1,704 pounds per length laying twelve feet.

Owing to the fact that the system was to be kept full of salt water it was decided that the ordinary type of valves built of iron and composition were not suitable, as a destructive galvanic action would result. The valves adopted were of composition throughout, with flanged ends, and were separated from the adjoining cast-iron pipes by heavy rings of pure rubber. The precautions taken in the case of the hydrants, which are empty when not in use, were to separate the composition valve-seat from the iron hydrant-pot by a lead joint, also to protect the end of the iron valve stem by a composition cap, making a tight joint with the rubber foot-valve.

An electrical duct, laid in the main pipe trench, carries a five-conductor cable with connections to each hydrant; two of these conductors are utilized, forming part of the regular electrical system of the Fire Department. Each hydrant is equipped with a break key, whereby the code signals can be transmitted to the fire-boat; portable instruments, consisting of Morse key and sounder, can also be connected into circuit at all hydrants and boat stations; thus, communication is possible at will between the hydrants, boat stations and central office. Two of these portable instruments are carried on each fire-boat, for use at the boat and at the hydrant in service.

A trial made at a distance of one-half mile from the water front, with one boat in service, conclusively proved that the system is a valuable addition to the equipment of the Fire Department; with an unlimited water supply, and with a nominal pumping capacity of 6,000 gallons per minute when one fire-boat is in service, or double that amount when both boats are used, the system can be depended upon to furnish a number of streams equal in power to those from the largest "Steamers," and, when necessary, streams of unusual power are available, *e.g.*, at the trial mentioned two streams, each of 1,500 gallons per minute, were played simultaneously through 2½-inch nozzles with a nozzle pressure of fifty pounds; three lines of 3-inch hose, each 300 feet long, were siamezed in this test.

All the work of establishing the salt-water system was done by the Water Department, with the exception of the electrical service, which was installed by the Fire Department.

SALT WATER FIRE-PIPE TEST, NOVEMBER 13, 1898.

Experiment Begun.	Experiment Ended.	Elapsed Time.	Line No. 1.					Line No. 2.					Line No. 3.					Line No. 4.					Line No. 5.					Line No. 6.					Total Discharge per Minute.	Pressure at Hydrant Outlets, Line No. 1.	Loss of Pressure in Hose, Line No. 1, corrected.	Loss of Pressure per 100' under given Discharge.	Remarks.
			Length of Hose.	Diam. of Hose.	Diam. of Nozzle.	Indicated Pressure at Nozzle.	Discharge per Minute.	Length of Hose.	Diam. of Hose.	Diam. of Nozzle.	Indicated Pressure at Nozzle.	Discharge per Minute.	Length of Hose.	Diam. of Hose.	Diam. of Nozzle.	Indicated Pressure at Nozzle.	Discharge per Minute.	Length of Hose.	Diam. of Hose.	Diam. of Nozzle.	Indicated Pressure at Nozzle.	Discharge per Minute.	Length of Hose.	Diam. of Hose.	Diam. of Nozzle.		Discharge per Minute (Approx.)	Length of Hose.	Diam. of Hose.	Diam. of Nozzle.		Discharge per Minute (Approx.)					
H.M.S.	H.M.S.	M.S.	Ft.	In.	In.	Lbs.	Gal.	Ft.	In.	In.	Lbs.	Gal.	Ft.	In.	In.	Lbs.	Gal.	Ft.	In.	In.	Lbs.	Gal.	Ft.	In.	In.			Ft.	In.	In.			Gals.	Lbs.	Lbs.	Lbs.	
10.27.30			150	3	$1\frac{1}{2}$			150	3	$1\frac{1}{2}$			150	3	$1\frac{1}{2}$																					Pumps started at 10.27.30.	
10.28.00	10.28.30	0.30	"	"	"	44.3	627	Into Eastman Sets.	"	"	45.3	617	Into Eastman Sets.	"	"	44.5	611																1,856	109.0	63.7	43.0	
10.28.30	10.29.00	0.30	"	"	"	50.0	668	"	"	"	51.8	660	"	"	"	50.3	651																1,979	125.0	75.0	50.0	
10.29.00	10.30.00	1.00	"	"	"	55.6	703	"	"	"	56.1	687	"	"	"	55.0	680																2,070	134.5	77.9	52.0	
10.30.00	10.31.00	1.00	"	"	"	57.7	716	"	"	"	58.1	699	"	"	"	57.0	693																2,108	138.6	79.8	53.0	
10.31.00	10.31.30	0.30																																			Shut down.
10.31.30	10.32.00	0.30	150	3	$1\frac{1}{2}$	49.5	664	150	3	$1\frac{1}{2}$	51.3	657	150	3	$1\frac{1}{2}$	50.0	648																1,969				
10.32.00	10.32.30	0.30	"	"	"	54.0	693	"	"	"	55.3	682	"	"	"	54.6	677																2,052				
10.32.30	10.33.30	1.00	"	"	"	57.0	712	"	"	"	58.3	700	"	"	"	57.0	693																2,106				
10.33.30	10.40.00	6.30	"	"	"	58.8	724	"	"	"	59.6	708	"	"	"	57.5	696																2,128				
10.40.00	10.41.30	1.30	"	"	"	60.9	732	"	"	"	61.8	721	"	"	"	58.1	699																2,152				Shut down at 10.41.30.
10.41.30	11.11.30																																				Changing hose lines and nozzles.
11.11.30			300	3	$1\frac{1}{2}$			300	3	$1\frac{1}{2}$			300	3	$1\frac{1}{2}$			300	3	$1\frac{1}{2}$			300	3	$1\frac{1}{2}$			300	3	$1\frac{1}{2}$							Pumps started at 11.11.30.
11.12.00	11.13.00	1.00	"	"	"	75.6	400	"	"	"	70.7	387	"	"	"	65.0	371	"	"	"	72.6	392	"	"		388	"	"		388	2,326	128.0	61.5	17.2			
11.13.00	11.14.00	1.00	"	"	"	86.8	429	"	"	"	82.0	417	"	"	"	85.2	425	"	"	"	84.4	423	"	"		424	"	"		424	2,542	140.0	52.2	17.4			
11.14.00	11.15.00	1.00	"	"	"	93.5	445	"	"	"	88.8	434	"	"	"	93.9	446	"	"	"	93.0	444	"	"		442	"	"		442	2,653	147.7	53.2	17.7			
11.15.00	11.17.00	2.00	"	"	"	100.0	459	"	"	"	94.8	448	"	"	"	101.3	463	"	"	"	98.7	457	"	"		457	"	"		457	2,741	157.8	52.8	17.6			
11.17.00	11.18.30	1.30	"	"	"	102.2	465	"	"	"	97.8	455	"	"	"	104.8	471	"	"	"	101.3	463	"	"		464	"	"		464	2,782	157.0	53.8	17.9			
11.18.30	11.19.30	1.00	"	"	"	104.4	470	"	"	"	105.2	472	"	"	"	109.1	481																	Pr. at Hyd. outlets, Line No. 1, Square.	Loss in Line No. 1, corrected.		
11.19.30	11.21.00	1.30						"	"	"	111.0	485	"	"	"	120.9	506																				Shut down at 11.21.00.
11.21.00	11.35.30																																				Changing nozzles.
11.35.30			300	3		Siamesed		300	3	2			300	3		Siamesed		300	3	2			300	3		Siamesed		300	3		Siamesed						Pumps started at 11.35.30.
11.38.00	11.36.30	0.30	"	"		with lines		"	"	"	81.5	1,105	"	"		with lines		"	"	"	76.3	1,070	"	"		with lines		"	"		with lines		2,175	134.5	92.0		
11.36.30	11.38.00	1.30	"	"		2 and 3		"	"	"	89.3	1,158	"	"		1 and 2		"	"	"	85.8	1,125	"	"		4 and 5		"	"		4 and 5		2,293	148.3	88.0		
11.38.00	11.39.00	1.00	"	"		Into Eastman Set.		"	"	"	91.0	1,170	"	"		Into Eastman Set.		"	"	"	88.6	1,153	"	"		Into Eastman Set.		"	"		Into Eastman Set.		2,323	151.5	90.5		
11.39.00	11.41.30	2.30	"	"				"	"	"	94.6	1,192	"	"				"	"	"	91.5	1,173	"	"				"	"				2,365	156.9	91.3		Shut down at 11.41.30.
11.41.30	11.49.00																																				Changing nozzles.
11.49.00			300	3		Siamesed		300	3	$2\frac{1}{2}$			300	3		Siamesed		300	3	$2\frac{1}{2}$			300	3		Siamesed		300	3		Siamesed						Pumps started at 11.49.00.
11.49.00	11.50.00	1.00	"	"		with lines		"	"	"	46.5	1,091	"	"		with lines		"	"	"	56.2	1,305	"	"		with lines		"	"		with lines		2,296				
11.50.00	11.50.30	0.30	"	"		2 and 3		"	"	"	55.7	1,108	"	"		1 and 2		"	"	"	60.2	1,247	"	"		4 and 6		"	"		4 and 5		2,445	128.5	71.8		
11.50.30	11.51.00	0.30	"	"		Into Eastman Set.		"	"	"	60.6	1,251	"	"		into Eastman Set.		"	"	"	65.2	1,298	"	"		Into Eastman Set.		"	"		into Eastman Set.		2,548	136.7	75.1		
11.51.00	11.52.00	1.00	"	"				"	"	"	63.5	1,280	"	"				"	"	"	66.7	1,313	"	"				"	"				2,593	143.0	78.5		
11.52.00	11.54.00	2.00	"	"				"	"	"	66.0	1,305	"	"				"	"	"	68.6	1,331	"	"				"	"				2,636	148.2	81.2		Shut down at 11.54.00.
11.54.00	11.55.30																																				Changing nozzles.
11.55.30			300	3		Siamesed		300	3	$2\frac{1}{2}$			300	3		Siamesed		300	3	$2\frac{1}{2}$			300	3		Siamesed		300	3		Siamesed						Pumps started at 11.55.30.
11.56.00	11.56.30	0.30	"	"		with lines		"	"	"	89.8	1,317	"	"		with lines		"	"	"			"	"		with lines		"	"		with lines			119.6	78.9		
11.56.30	11.57.30	1.00	"	"		2 and 3		"	"	"	83.8	1,383	"	"		1 and 2		"	"	"	47.4	1,139	"	"		4 and 6		"	"		4 and 5		2,822	128.0	83.2		
11.57.30	11.59.00	1.30	"	"		Into Eastman Set.		"	"	"	47.6	1,442	"	"		into Eastman Set.		"	"	"	50.0	1,480	"	"		Into Eastman Set.		"	"		into Eastman Set.		2,922	140.7	92.1		
11.59.00	12.00.00	1.00	"	"				"	"	"	48.8	1,462	"	"				"	"	"	51.0	1,493	"	"				"	"				2,955	146.0	96.2		Shut down at 12.00.00.

Lines 1, 2 and 3, from hydrant at Post Office square.
Lines 4, 5 and 6, from hydrant on Congress street, near Milk street.
In the last three sets of experiments, two Eastman Sets were used with three lines from each hydrant. Each Eastman Set includes 16 feet of $3\frac{1}{2}$-inch hose.
In the set of experiments with six $1\frac{1}{2}$-inch nozzles, the discharge from Lines Nos. 5 and 6 is approximate, as no pressures were taken at the nozzles, therefore the total discharge for this set of experiments is approximate.

GENERAL STATISTICS.

BOSTON WATER DEPARTMENT.

Daily average amount used through meters, gallons	15,717,100
Number of services	84,114
Number of meters and motors	4,865
Length of supply and distributing mains, in miles	689.2
Number of public fire-hydrants in use	7,068
Yearly revenue from water-rates	$2,318,296 74
Yearly revenue from metered water	909,196 35
Percentage of total revenue from metered water,	39.2
Yearly expense of maintenance	$543,390 77

Average Maximum and Minimum Monthly and Yearly Heights, in Feet, Above City Base, to which Water would Rise at Different Stations on the Boston Water Works.

1898.	Boston Common.		Engine-house No. 8, Salem Street.		Engine-house No. 7, East Street.		Engine-house No. 38, Congress Street, So. Boston.		Engine-house No. 2, Fourth Street, South Boston.		Engine-house No. 9, Paris Street, East Boston.		Engine-house No. 16, River Street, Dorchester.		Engine-house No. 32, Bunker Hill Street, Charlestown.		710 Albany Street.		Engine-house No. 18, Harvard Street, Dorchester. High Service.		City Hall. High Service.		Engine-house No. 24, Quincy Street. High Service.	
Month.	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*	*Max.*	*Min.*
January ..	121.0	103.9	123.1	103.7	121.4	103.6	119.9	102.4	119.9	99.9	115.7	89.4	121.4	102.7	[3]154.8	[3]147.0	123.0	106.4	236.5	204.7	249.2	241.3	239.8	217.7
February..	120.9	102.5	124.0	103.5	120.5	103.1	119.7	102.1	119.0	99.0	115.9	90.1	120.5	101.6	153.9	149.0	121.1	105.6	234.8	210.5	248.2	241.2	239.2	221.2
March.....	125.8	105.8	127.7	106.6	125.2	106.1	124.6	104.8	125.2	103.2	121.6	93.8	126.0	105.2	154.9	150.4	125.9	108.6	239.8	213.5	251.2	244.7	242.3	222.7
April	127.8	110.0	127.0	109.7	126.3	109.6	125.8	109.3	126.8	106.1	[1]125.0 [1]155.3	100.0 147.0	126.7	108.5	153.6	148.6	127.6	112.4	240.2	211.7	251.6	244.4	242.6	222.1
May	128.7	111.3	127.9	109.1	126.9	109.8	126.6	108.4	127.7	106.0	155.2	147.0	127.9	108.8	154.5	151.3	128.2	112.0	[2]246.7	232.4	251.3	245.1	[2]248.5	240.9
June	128.9	110.9	127.9	108.2	127.3	109.4	125.9	107.6	127.8	105.4	155.0	146.4	127.8	107.7	154.9	151.9	128.0	111.6	247.0	229.5	251.9	245.4	248.3	240.6
July.....	128.8	110.6	127.6	108.0			126.0	108.0	127.0	104.1	155.1	145.3	127.5	107.7	156.1	152.1	127.8	111.9	245.8	229.8	251.4	247.0	248.1	240.8
August....	128.4	110.1	128.6	107.6			125.7	107.1	126.3	102.7	154.0	143.6	127.0	106.6	155.6	151.7	127.4	110.3	245.5	230.3	250.6	246.2	247.6	241.4
September.	128.7	109.7	128.9	109.3			126.0	106.9	127.2	104.3	154.6	144.6	127.5	106.4	155.7	151.6	127.4	110.9	245.2	227.1	250.1	246.0	246.5	238.7
October....	129.2	113.0	129.6	111.7	128.3	111.4	126.5	110.0	127.7	107.5	155.1	145.5	128.1	109.8	155.2	151.9	127.7	113.1	246.6	233.2	250.8	246.0	247.1	239.9
November.	129.3	113.5	129.6	112.3	128.7	113.3	127.0	111.5	128.1	109.0	154.4	146.2	129.4	111.5	154.4	152.0	127.8	114.1			250.6	246.3	248.4	242.0
December.	126.0	110.3	126.1	112.3	126.3	110.0	125.0	108.7	124.8	105.4	151.0	141.3	126.0	108.0	152.1	147.2	125.7	111.0			250.7	246.5	248.4	243.2
Averages.	127.0	109.3	127.3	108.5	125.7	108.5	124.9	107.2	125.6	104.4	154.4	145.2	126.3	107.0	154.6	150.4	126.5	110.7			250.7	245.0	247.9	240.9

[1] On April 21, East Boston supplied from Metropolitan L. S.
[2] On April 26, 36-inch high service line through Roxbury turned on.
[3] On January 1, Charlestown supplied by Metropolitan L. S.

Statement of Operations at the East Boston Pumping Station for the Year 1898.

1898.	ENGINES NOS. 1 AND 2.				ENGINE NO. 3.					
	Total pumping time.		Total amount pumped to Reservoir.	Daily average.	Total pumping time.		Total amount pumped to tank, Breed's Island.	Daily average.	Total amount of coal consumed.	Per cent. of ashes and clinkers.
Month.	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Hrs.*	*M.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*
January.....	357	15	15,682,660	505,892	182	45	2,835,000	91,452	63,540	20.2
February....	345	45	15,103,200	539,400	172	45	2,815,680	100,560	61,670	20.3
March.....	303	15	12,375,300	399,203	175	00	2,873,040	92,678	54,870	19.5
April.....	189	45	7,609,980	380,499	170	15	2,639,280	87,976	38,600	19.5
May					172	00	2,392,200	77,168	20,520	19.9
June					183	45	2,564,400	85,480	17,110	19.6
July.....					214	30	3,169,080	102,228	19,270	19.9
August.....					185	00	2,640,840	85,189	15,970	19.2
September...					158	15	2,221,380	74,046	15,280	18.3
October.....					157	00	2,253,480	72,693	16,680	18.7
November.					153	15	2,183,100	72,770	18,300	18.5
December...					158	15	2,201,160	73,372	20,450	18.4
Totals and Averages..	1,196		50,771,140	457,398	2,082	45	30,788,640	84,817	362,260	19.6

On April 22 all of East Boston (except what tank supplies) supplied from Metropolitan.

Statement of Operations at the West Roxbury Pumping Station for the Year 1898.

1898.	Total pumping time.		Total amount pumped.	Daily average amount pumped.	Quantity pumped per lb. of coal.	Total amount of coal consumed.	Per cent. of ashes and clinkers.	Average lift.
Month.	*Hours.*	*Min.*	*Gallons.*	*Gallons.*	*Gallons.*	*Lbs.*	*Per cent.*	*Feet.*
January....	671	00	9,517,620	307,020	181.6	52,385	17.7	154.1
February ..	595	00	8,263,928	295,140	167.2	49,400	17.9	151.3
March.....	659	00	8,598,938	277,385	171.0	50.275	16.7	148.2
April.....	631	00	8,253,563	275,118	179.5	45,975	16.5	148.3
May.....	658	00	9,367,988	302,193	188.5	49,700	16.5	143.7
June.....	697	30	9,627,901	320,930	187.3	51,400	16.7	146.1
July.....	753	00	10,455,638	337,279	175.3	59,625	16.9	147.0
August.....	694	00	10,019,738	323,217	173.4	57,800	16.4	144.1
September..	660	30	10,184,813	339,494	179.2	56,850	15.9	144.8
October	694	00	8,435,962	272,128	171.9	49,075	15.8	138.5
November..	638	00	7,322,363	244,079	180.2	40,625	15.9	131.9
December..	497	00	7,102,501	229,113	170.5	41,650	16.6	126.2
Totals and Averages.	7,848	00	107,150,953	293,564	177.2	604,760	16.6	143.7

Monthly Rainfall in Inches, during 1898, at Various Places in Eastern Massachusetts.

PLACE.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
Framingham	6.54	4.27	2.40	4.73	3.05	2.24	3.98	7.42	2.09	7.01	7.24	3.30	54.27
Dam 4, Ashland	7.11	4.70	2.40	4.59	3.40	2.25	4.65	7.54	2.81	6.72	6.64	3.28	56.09
Cordaville	7.27	4.72	2.55	4.86	3.29	2.96	3.76	9.02	3.25	6.55	6.58	3.44	58.25
Lake Cochituate	6.83	4.29	2.54	5.07	3.07	2.08	3.55	7.08	3.03	6.82	6.91	3.44	54.71
Chestnut Hill Reservoir	5.60	5.58	2.20	6.17	4.45	2.36	5.57	6.06	1.77	7.38	7.42	2.93	57.49
Mystic Lake	5.62	5.00	2.11	6.21	3.97	2.06	5.57	7.50	2.64	7.37	6.81	3.00	57.86
Gibson street, Dorchester				6.91	4.03	1.80	6.07	5.68	1.93	7.85	4.97	2.53	
Cambridge Observatory	4.07	5.35	2.03	5.26	3.73	1.66	4.25	7.29	1.72	6.71	6.63	2.53	51.23
Waltham, Boston Manufacturing Company	6.19	3.42	2.18	6.54	3.39	1.92	5.74	6.37	1.62	6.93	6.50	3.30	54.10
Lowell, Locks and Canals Company	4.52	7.05	1.65	5.20	3.04	3.65	2.93	8.23	1.97	6.85	6.45	2.74	54.28
Average of above ten places	5.97	4.93	2.23	5.55	3.54	2.30	4.61	7.22	2.28	7.02	6.62	3.05	55.36

[FROM THE CITY ENGINEER'S REPORT TO THE STREET DEPARTMENT.]

The work covers the same ground as heretofore, namely, the supervision of the construction of assessment streets, boulevards, street paving and consideration and reports upon various questions which arise concerning the work.

The repairs upon asphalt pavement have been supervised, and a table is annexed giving the amount of repairs and the cost in detail on all asphalt pavement upon which the maintenance guaranty has expired. The table showing details of all asphalt streets in the city has been corrected to date.

On Columbus-avenue extension the work has been in progress throughout the year, and the avenue was so far completed as to be in use in December.

The table showing lengths and areas of paving on accepted streets and public alleys has been brought up to February 1, 1899.

Street paving has been supervised in all cases where requested. All paving laid on the before-mentioned avenues is included in the quantities given. All granite block paving on concrete base has been laid with pitch and pebble joints *except* 1,702 square yards which on account of unfavorable weather, was laid temporarily with gravel joints.

Granite block pavement on a concrete base, laid with pitch and pebble joints, 39,789 square yards.

Granite block pavement on a gravel base, laid with pitch and pebble joints, 2,676 square yards.

Granite block pavement on a concrete base, laid with gravel joints (temporarily), 1,702 square yards.

Granite block pavement on a gravel base, laid with gravel joints, 37,030 square yards.

Trinidad lake asphalt, with a binder course of asphaltic cement concrete, on an American cement concrete base, 5,166 square yards, at an average cost of about $3.00 per square yard.

Sicilian rock asphalt on an American cement concrete base, 2,804 square yards, at an average cost of about $3.00 per square yard.

Asphaltina, on an American Portland cement concrete base, 569 square yards, at a cost of $2.93 per square yard.

The cost per square yard of asphalt given above does not

include the cost of preparing roadbed, except in the case of asphaltina pavement, the price for which includes all work. All asphalt is laid with a maintenance guaranty for five years, except that Public Alley No. 437 is laid with a guaranty for ten years.

Edgestone set, 85,818 linear feet; gutter paving laid, 23,035 square yards; brick sidewalks laid, 27,883 square yards; crushed stone sidewalks constructed, 25,390 square yards.

Artificial stone sidewalks, 37,310 square feet; flagging crosswalks laid, 5,686 square yards; macadam surface (6 inches), 44,600 square yards; Telford (8 inches) macadam (4 inches), 33,900 square yards.

A List of Streets Paved with Sheet Asphalt, and having a Maintenance Guaranty, February 1, 1899.

TRINIDAD ASPHALT.

City Proper.

NAME.	Limits.	Base.	Length feet.	Length miles.	Area.	Guaranty expires.
Barton ct.	Brighton st. to Barton st.	Cobble	134	.025	186	May 16, 1899
Batterymarch st.	Milk st. to Liberty sq.	Concrete	150	.028	466	Sept. 28, 1901
Beacon st.	150 ft. from west curb line of Gloucester to 68 ft. beyond west line of Gloucester st.	Concrete	218	.041	1,183	June 16, 1903
Bond st.	Hanson st. to Milford st.	Concrete	192	.036	426	July 1, 1900
Boylston st.	Easterly side of Berkeley st. across Clarendon st.	Concrete	656	.124	3,869	Oct. 4, 1902
Brimmer st.	Beacon st. to Pinckney st.	Concrete	1,087	.206	3,300	Aug. 31, 1900
Chambers st.	Green st. across Poplar st.	Cobble	460	.087	1,061	May 16, 1899
Chambers st.	Brighton st. to Charles st.	Cob. and Conc.	272	.052	604	July 1, 1900
Charter st.	Hanover st. across Unity st.	Cobble	318	.060	636	May 16, 1899
Columbus ave.	Massachusetts ave. to 301 ft. south of Camden st.	Concrete	903	.171	5,418	Nov. 7, 1901
Cooper st.	Endicott st. to Charlestown st.	Concrete	205	.039	604	Sept. 27, 1902
Corning st.	Washington st. to Shawmut ave.	Concrete	338	.064	734	May 25, 1901
Court sq.	Easterly side	Concrete	333	.063	942	June 14, 1899
Dartmouth st.	Boylston st. to Newbury st.	Concrete	266	.050	2,058	Sept. 8, 1899
Edinboro' st.	Essex st. to Beach st.	Concrete	470	.089	924	Aug. 14, 1900
Harrison ave.	E. Newton st. to E. Springfield st.	Concrete	928	.176	2,681	Aug. 14, 1900
Harrison ave.	E. Springfield st. to Roxbury line	Concrete			130	Aug. 14, 1900
Kilby st.	State st. to Milk st., including Liberty sq.	Concrete	640	.121	4,059	Sept. 28, 1903
Laconia st.	Washington st. to Harrison ave.	Concrete	330	.063	727	June 18, 1901
La Grange st.	Tremont st. toward Washington st.	Concrete	181	.034	355	Oct. 23, 1902
Lincoln pl.	Worcester st. to W. Springfield st.	Concrete	217	.041	313	Aug. 17, 1902
North Margin st.	Stillman st. to Thacher st.	Concrete	515	.098	1,154	Sept. 10, 1900
Oxford st.	Beach st. to Essex st.	Macadam	430	.081	735	Nov. 1, 1899
Parkman st.	N. Anderson st. across Blossom st.	Concrete	241	.046	550	Oct. 14, 1903

Pinckney st.	Charles st. across Brimmer st.	Concrete	271	.051	723	Aug. 31, 1900
Pine st.	Washington st. to Harrison ave.	Concrete	419	.079	597	June 18, 1901
Public Alley 437	Berkeley st. to Arlington st.	Concrete	631	.120	561	Dec. 10, 1908
Spring st.	Poplar st. to Leverett st.	Concrete	447	.085	908	May 20, 1900
Stevens st.	Lincoln pl. toward Shawmut ave.	Concrete	16	.003	22	Aug. 17, 1902
Tileston st.	Salem st. to Unity st.	Concrete	163	.031	124	Aug. 14, 1900
Unity st.	Charter st. to Tileston st.	Concrete	330	.063	500	Oct. 6, 1902
Water st.	Liberty sq. to Broad st.	Concrete	252	.048	682	Oct. 10, 1901
Wiget st.	Salem st. to North Margin st.	Concrete	259	.049	240	Sept. 25, 1902
Totals			12,272	2.341	36,472	

Charlestown.

Bunker Hill st.	At Tufts st.	Concrete			150	Nov. 3, 1902
Corey st.	Moulton st., 124 ft. toward Medford st.	Concrete	124	.024	276	Nov. 3, 1902
Moulton st.	Easterly side Corey st. to Vine st.	Concrete	81	.015	243	Nov. 3, 1902
Moulton st.	Vine st. to Bunker Hill st.	Concrete	130	.025	390	Nov. 3, 1902
Rutherford ave.	Devens st. toward Chapman st.	Concrete	128	.024	284	Nov. 5, 1902
Tufts st.	Bunker Hill st., northerly	Concrete	141	.027	415	Nov. 3, 1902
Vine st.	Bunker Hill st. across Moulton st.	Concrete	165	.031	670	Nov. 3, 1902
Totals			769	.146	2,428	

Roxbury.

Cabot st.	East side Vernon st. to Linden Park st.	Concrete	484	.091	1,390	Aug. 30, 1902
Columbus ave.	301 ft. south of Camden st. across Terry st.,	Concrete	2,640	.500	15,840	Nov. 7, 1901
Totals			3,124	.591	17,230	

SICILIAN ROCK ASPHALT.

City Proper.

NAME.	Limits.	Base.	Length feet.	Length miles.	Area.	Guaranty expires.
Acton st.	Washington st. to Bradford st.	Concrete	259	.049	352	Nov. 1, 1901
Albany st.	Easterly side of Stoughton st. across E. Concord st.	Concrete	285	.054	1,710	Nov. 8, 1902
Ash st.	Oak st. across Nassau st.	Cobble	220	.041	391	Oct. 26, 1899
Avery st.	Washington st. to Mason st.	Concrete	360	.068	275	Oct. 18, 1902
Barton st.	Leverett st. to Milton st.	Concrete	427	.081	723	Aug. 14, 1900
Bradford st.	Waltham st. to Shawmut ave.	Concrete	600	.114	1,270	Sept. 11, 1902
Charles st.	Front of Eye and Ear Infirmary	Concrete	191	.036	225	Oct. 8, 1899
Cobb st.	Washington st. to Shawmut ave.	Concrete	347	.066	1,041	Sept. 16, 1902
Exeter pl.	Chauncy st. to Harrison ave.	Concrete	170	.032	387	Oct. 20, 1902
Fabin st.	Newland st. to Ivanhoe st.	Concrete	421	.080	615	Sept. 10, 1900
Fay st.	Dover st. to Harrison ave.	Cobble	318	.060	560	July 26, 1899
Hamburg st.	Mystic st. to Harrison ave.	Concrete	383	.073	597	Oct. 1, 1901
Hanover st.	Tileston st. across Charter st.	Concrete	315	.060	934	May 14, 1901
Huntington ave.	B. & A. R.R. Bridge to Cumberland st.	Concrete	1,591	.301	8,840	Oct. 12, 1901
Mason st.	213 ft. south of West st. for a distance of 231 ft. southerly	Block	231	.044	480	May 25, 1899
Massachusetts ave.	Washington st. to Albany st. (southerly roadway)	Concrete	662	.125	4,151	Sept. 17, 1899
Mayo st	Castle st. to Cobb st.	Concrete	251	.048	418	Sept. 11, 1902
Meander st.	E. Dedham st. to Malden st.	Concrete	307	.058	437	Sept. 3, 1901
Mystic st.	Malden st. to E. Dedham st.	Concrete	204	.039	226	Oct. 20, 1901
Mystic st.	E. Dedham st. to E. Canton st.	Concrete	215	.041	335	Oct. 20, 1901
Mystic st.	E. Canton st. to E. Brookline st.	Concrete	216	.041	337	Oct. 20, 1901
North Margin st.	Thacher st. toward Endicott st.	Concrete	205	.039	518	Nov. 19, 1902
Norwich st.	Mystic street to Meander st.	Concrete	221	.043	339	Sept. 24, 1901
Ohio st.	Washington st. to Shawmut ave.	Concrete	343	.065	277	July 30, 1901
Pemberton sq.	Front of Suffolk County Court House	Concrete	323	.061	1,365	May 8, 1899
Prince st.	Hanover st. to Bennet ave.	Concrete	293	.055	654	July 1, 1900

Shawmut ave.	132 ft. south of Castle st. across Cherry st.	Concrete	227	.062	945	Sept. 19, 1903
Taylor st.	Dwight st. to Milford st.	Concrete	196	.037	274	May 29, 1901
Whitmore st.	Kneeland st. to Harvard st.	Concrete	249	.047	445	Aug. 14, 1900
Totals			10,130	1.919	29,121	

Charlestown.

Warren st.	Winthrop st. to Soley st.	Concrete	127	.024	365	Sept. 10, 1900

South Boston.

Athens st.	W. Second st. to A st.		617	.117	916	Oct. 9, 1900
E. Broadway.	Front of Lincoln School	Concrete	180	.034	1,000	Oct. 7, 1902
K st.	E. Sixth st. to E. Eighth st.	Concrete	566	.107	1,083	May 20, 1901
W. Broadway	N. Y. & N. E. R.R. Bridge to E st. (4 ft. gutters)	Concrete			1,487	Oct. 2, 1902
W. Broadway	150 ft. west of F st. to 267 ft. east of F st.	Concrete	448	.085	1,544	Oct. 28, 1902
W. Broadway	267 ft. east of F st. to 44 ft. west of Dorchester st.	Concrete	410	.078	1,818	Dec. 15, 1903
Totals			2,221	.421	7,848	

Roxbury.

Columbus ave.	Terry st. to within 61 ft. of Station st.	Concrete	884	.168	5,304	Oct. 23, 1901
Huntington ave.	Easterly side of Cumberland st. to Massachusetts ave.	Concrete	747	.141	4,150	Oct. 12, 1901
Huntington ave.	Massachusetts ave. to Gainsborough st.	Concrete	587	.111	3,372	Oct. 12, 1901
Totals			2,218	.420	12,826	

SEYSSEL ASPHALT.

NAME.	Limits.	Base.	Length feet.	Length miles.	Area.	Guaranty expires.
Paul st.	Emerald st. to Village st.	Concrete	133	.025	236	Oct. 23, 1902
Paul st.	Village st. to Tremont st.	Concrete	276	.052	456	Oct. 23, 1902
Pelham st.	Washington st. to Shawmut ave.	Concrete	320	.061	693	Oct. 12, 1902
Waterford st.	Washington st. to Shawmut ave.	Concrete	316	.060	544	Nov. 13, 1902
Totals			1,045	.198	1,929	

ASPHALTINA.

Hayward pl	Washington st. to Harrison ave	Concrete	260	.049	578	Nov. 7, 1903
Massachusetts ave	Columbus ave. to Tremont st. (northerly roadway)	Concrete	267	.050	1,622	Oct. 11, 1902
Totals			527	.099	2,200	

SUMMARY.

Trinidad asphalt	16,165 feet, or 3.077 miles, or	57,130 square yards.	
Sicilian rock asphalt	14,569 feet, or 2.760 miles, or	49,795 square yards.	
Seyssel asphalt	1,045 feet, or 0.198 miles, or	1,929 square yards.	
Asphaltina	527 feet, or 0.099 miles, or	2,200 square yards.	
Total sheet asphalt under maintenance guaranty, February 1, 1899	32,306 feet, or 6.135 miles, or	111,054 square yards.	

Cost of Asphalt Patching, 1898.

TRINIDAD ASPHALT.

STREET.	Year laid.	Base.	Length miles.	Total yards in street.	Yards resurfaced.	Cost of patching.	Cost per square yard of surface.
Liberty sq., that part east of Kilby st	1881	Concrete ..		505			
Court sq., westerly side	1881	Concrete ..	.064	950	129.92	$324 79	$0.342
Doane st., Kilby to Broad st.	1881	Concrete ..	.059	624	24.50	61 25	.098
Congress sq. intersection	1883	Concrete ..	.004	37	2.50	6 25	.169
N. Bennet st., Hanover to Salem st.	1883	Cobble	.105	920	83.64	209 10	.227
Albany st., Concord to Springfield st	1884	Concrete ..	.085	2,700	*81.43	195 73	.072
Endicott st.	1884	Cobble	.059	1,005	55.04	137 60	.137
Ash st., Bennet to Nassau st.	1887	Concrete ..	.044	427	28.23	70 58	.165
Bennet st., Washington st. to Harrison ave.	1887	Concrete ..	.034	350	58.99	147 47	.421
Central st., Kilby to Broad st	1887	Concrete ..	.059	869	22.45	56 13	.065
Cooper st., N. Margin to Endicott st.	1887	Concrete ..	.037	597	3.36	8 40	.014
Exchange pl., Congress to Kilby st	1887	Concrete ..	.046	678	37.32	93 30	.138
Poplar st., Spring to Charles st	1887	Cobble	.109	1,192	24.71	61 77	.052
Tileston st., Hanover st. across Unity st	1887	Cobble	.048	350	28.71	71 78	.205
Wiggin st., Tileston to N. Bennet st	1887	Cobble	.020	119	1.65	4 12	.035
W. Sixth st., between C and D st.	1887		.017	343	2.06	5 15	.015
Brattle sq., Brattle to Elm st.	1888	Concrete ..	.053	670	21.91	54 77	.082
D st., Fifth to Gold st.	1889		.024	448	25.08	62 70	.140
Water st., Congress to Kilby st.	1889	Concrete ..	.048	694	143.06	357 65	.516
Austin st., Charlestown, Seminary pl. to Lawrence st.	1891	Concrete ..	.027	421			
Carried forward			.942	13,899	769.56	$1,929 44	$2.893

*Part surface heater work.
Prices paid, $2.50 per square yard, entire removal. Average cost, $0.155 per yard.
Prices paid, $2.50 per square yard, surface heater work.

Cost of Asphalt Patching, 1898. — *Concluded.*

TRINIDAD ASPHALT.

STREET.	Year laid.	Base.	Length miles.	Total yards in street.	Yards resurfaced.	Cost of patching.	Cost per square yard of surface.
Brought forward			.942	13,899	769.56	$1,929 44	$2.893
Beacon st., Charles, across Arlington st	1891	Concrete ..	.165	3,800	104.42	261 05	.069
Cabot st., Tremont to Ruggles st	1891	Concrete ..	.234	3,571	35.09	87 72	.025
Court st., Washington to Court sq	1891	Concrete ..	.044	642	57.36	143 40	.223
Hollis st., Tremont toward Washington st	1891	Block	.052	521	31.01	77 53	.149
Hudson st., Beach to 90 ft. north of Curve st	1891	Concrete ..	.266	3,938	200.70	501 75	.127
Moon st., North sq. to Fleet st	1891	Cobble	.034	384			
Rogers st., Dorchester ave. to Preble st	1891	Cobble	.068	480			
Sun Court st., Moon st. to North st	1891	Cobble	.029	218	1.32	3 30	0.015
Warrenton st	1891	Concrete ..	.216	2,497	17.91	44 78	.018
Beacon st., Dartmouth st. to within 150 ft. of Gloucester st	1892	Concrete ..	.330	9,277	*482.64	1,201 25	.129
Brighton st., Leverett st. to Allen st	1892	Cobble	.160	1,737	87.29	218 22	.126
Cherry st., Washington st. to Shawmut ave	1892	Concrete ..	.063	594	19.53	48 83	.082
Clark st., Hanover st. to North st	1892		.060	614			
Davis st., Washington st. to Harrison ave	1892	Concrete ..	.061	646			
Groton st., Washington st. to Shawmut ave	1892		.063	558			
Hanover ave., Hanover st. to North st	1892		.058	266			
Malcolm st., Mt. Vernon st. to Chestnut st	1892		.049	290			
Massachusetts ave., Columbus ave. to Washington st., southerly roadway	1892	Concrete ..	.174	5,549	228.74	571 85	.103
Poplar st., Chambers st. to Spring st	1892	Cobble	.115	1,250	3.36	8 40	.007
Stillman st., Salem st. to Endicott st	1892		.028	417			
Stoddard st., Howard st. to Court st	1892		.026	150	4.70	11 75	.078
Thacher st., Charlestown st. to Endicott st	1892	Concrete ..	.038	562	7.84	19 60	.035

Cabot st., Ruggles st. to Vernon st.	1892	Concrete ..	.137	2,988	6.06	15 15	.005
E st., W. Third st. to Bolton st.	1892		.021	419			
W. Third st., west of E st., across E st.	1892		.035	769			
Columbus ave., B. & A. R.R. to Massachusetts ave.		Concrete ..	.663	15,000	2,404.20	6,010 50	.401
Harrison ave.		Concrete ..	.144	995	10.06	25 15	.025
Totals			4.275	72,031	4,476.79	$11,178 77	$5.510

* Part surface heater work.
Prices paid, $2.50 per square yard, entire removal. Average cost, $0.155 per yard.
Prices paid, $2.50 per square yard, surface heater work.

Sicilian Rock Asphalt.

Street.	Year laid.	Base.	Length miles.	Total yards in street.	Yards resurfaced.	Cost of patching.	Cost per square yard of surface.
Broadway, Dorchester ave. to A st.	1892	Concrete ..	.068	2,000	183.80	$459 50	$.230
Decatur st., Washington st. to Harrison ave.	1892	Concrete ..	.070	781	18.09	45 22	.058
Motte st., Washington st. to Harrison ave.	1892	Concrete ..	.063	516	4.12	10 30	.020
Athens st., B st. to C st.	1892	Concrete ..	.098	746			
Totals			.299	4,043	206.01	$515 02	$.308

Price paid, $2.50 per square yard.
Average cost, $0.127 per square yard.

Beacon street, from 98 feet east of the easterly line of Gloucester street to 128 feet west of the easterly line of Gloucester street, was paved with 2 inches of Trinidad lake asphalt, with 1½ inches of bituminous concrete binder, on a 6-inch American cement concrete base, by the Barber Asphalt Paving Company. The old pavement was removed, roadway excavated, edgestones reset and crosswalks laid by the Street Department. Former pavement was Hastings asphalt blocks on a gravel base, laid in 1892.

Brattle street, Court street to Washington street, was repaved with old granite blocks on a gravel base, with pitch and pebble joints. The old blocks were barred out and bed prepared by the Street Department. Roadway was repaved, edgestones reset, brick sidewalks and flagging crosswalks relaid by H. Gore & Co. With the exception of a small portion near Washington street, which it paid for by agreement, The Boston Elevated Railway Company repaved its track.

Brighton street, Lowell street to Leverett street, including tracks of the Boston Elevated Railway Company, was paved with large granite blocks on a gravel base with pitch and pebble joints. The old pavement was removed and bed prepared by the Street Department. Roadway paving was laid, edgestones reset, brick sidewalks and flagging crosswalks relaid by Dennis J. Kiley. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on gravel bed and gravel joints.

Bunker Hill street, Chelsea street to Elm street, including the tracks of the Boston Elevated Railway Company, was paved with large granite blocks on a gravel base with gravel joints. The old pavement was removed and bed prepared by the Street Department. Roadway paving was laid, edgestones reset, brick sidewalks and flagging crosswalks were relaid by John Turner & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on a gravel base with gravel joints. Eight new catch-basins were built; three of them were Bradlee head pattern and five cast-iron D-frame pattern.

Commercial street, State street to Clinton street, was paved with large granite blocks on a 6-inch American cement concrete base with pitch and pebble joints. The old pavement was removed and roadway excavated by the Street Department, concrete base laid by Perrin & Carter, roadway paving laid, edgestones reset, brick sidewalks and flagging crosswalks laid by H. Gore & Co. Former pavement was old granite blocks on gravel base, with gravel joints.

Hanover street, Court street to Washington street, including tracks of the Boston Elevated Railway Company, was paved with "Philadelphia" size granite blocks on a 6-inch American cement concrete base with pitch and pebble joints. The old pavement was removed and roadway excavated by the Street Department, concrete base laid by Perrin & Carter, roadway

paving laid, edgestones reset, brick sidewalks and flagging crosswalks laid by H. Gore & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on a gravel base, with gravel joints.

Hayward place, Washington street to Harrison avenue, was paved with 2½ inches of asphaltina (a patented coal tar production) on a 6-inch American Portland cement concrete base by the Boston Paving Company. The old pavement was removed and roadway excavated by the Boston Paving Company. Former pavement was old granite blocks on a gravel bed, with gravel joints; one new catch-basin was built.

Howard street, Bulfinch street to Court street, was paved with large granite blacks on a 6-inch American cement concrete base, with pitch and pebble joints. The old pavement was removed and roadway excavated by the Street Department. Concrete base was laid by Perrin & Carter, roadway paving was laid, edgestones set, brick sidewalks and flagging crosswalks laid by H. Gore & Co. Former pavement was old granite blocks on gravel base, with gravel joints.

Kilby street, State street to Milk street, was paved with 1½ inches Trinidad lake asphalt, with 1½ inches of bituminous concrete binder on existing concrete base, by the Barber Asphalt Paving Company. The old surface was removed; concrete base was regraded by the Asphalt Company. Former pavement was Trinidad lake asphalt, originally laid in 1881.

Parkman street, North Anderson street across Blossom street, was paved with 1½ inches of Trinidad lake asphalt, with 1½ inches of bituminous concrete binder on a 6-inch American cement concrete base, by the Barber Asphalt Paving Company. The roadway was excavated and gutter blocks removed by the Street Department. Former surface was macadam, with granite block gutters.

Shawmut avenue, from southerly side of Cherry street to 108 feet north of Cobb street, between the rails of surface tracks and curbs, was paved with 2½ inches of Sicilian rock asphalt on a 6-inch American cement concrete base, by the Boston Asphalt Company; the spaces between the rails and tracks of the Boston Elevated Railway Company were paved with large granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints, by H. Gore & Co. The old pavement was removed and roadway excavated by the Street Department; edgestones were reset and brick sidewalks and flagging crosswalks relaid by H. Gore & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on gravel base, with gravel joints.

Shawmut avenue, Tremont street to Pleasant street, including the tracks of the Boston Elevated Railway Company, was paved with "Philadelphia" size granite blocks on a 6-inch American cement concrete base, with pitch and pebble joints,

and also temporarily with gravel joints. The old pavement was removed and roadway excavated by the Street Department; concrete base was laid by Perrin & Carter; roadway paving was laid, edgestones reset, brick sidewalks and flagging crosswalks laid by H. Gore & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on a gravel base, with gravel joints.

Tremont street, Boylston street to Pleasant street, including the tracks of the Boston Elevated Railway Company, was paved with "Philadelphia" size blocks on a 6-inch American cement concrete base with pitch and pebble joints. The old pavement was removed and roadway excavated by the Street Department; concrete base was laid by Perrin & Carter, roadway paving was laid, edgestones set, brick sidewalks and flagging crosswalks laid by H. Gore & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on a gravel base with gravel joints. Two new catch-basins were built.

Tremont street, Weston street to Hammond street, was paved with large granite blocks on a gravel base with gravel joints. The old pavement was removed and roadway excavated by the Street Department; roadway paving was laid, edgestones set, brick sidewalks and flagging crosswalks laid by James Doherty & Co. Former pavement was old granite blocks on gravel base with gravel joints.

West Broadway, from 257 feet east of the easterly line of F street to near Dorchester street, including the portion of the Boston Elevated Railway tracks in front of the waiting room, was paved with 2½-inches of Sicilian rock asphalt on a 6-inch American cement concrete base by the Boston Asphalt Company. The old pavement was removed and roadway excavated, edgestones set, brick sidewalks and flagging crosswalks laid by H. Gore & Co. The Boston Elevated Railway Company, by agreement, paid for the portion within its tracks. Former pavement was old granite blocks on a gravel base, with gravel joints.

New Streets.

The following streets were constructed under chapter 323 of the Acts of 1891, and acts in amendment thereof or in addition thereto:

Belmore terrace, Boylston street to Boylston terrace, is about 301 feet long. The contract for constructing the surface of this street was awarded to Patrick O'Hara & Co. Work under this contract was begun April 27, 1898, and completed August 3, 1898, at a total cost of $1,993.09. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, gutter blocks and straight edgestones were furnished by the city and hauled to the site of the work by the contractor. Circular edgestone was furnished on the work by the city; flagging for crosswalks was furnished by the contractors.

Bernard street, Harvard street to Talbot avenue, is about 1,406 feet long. The contract for constructing the surface of the street was awarded to John A. Whittemore's Sons. Work under this contract was begun April 21, 1898, and completed August 9, 1898, at a total cost of $3,207.98. It is a 6-inch macadam road with crushed stone sidewalks, in part. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor. Gutter blocks were furnished on the work by the city; flagging for crosswalks was furnished by the contractor. Artificial stone sidewalks (4 feet wide) were laid by W. A. Murtfeldt Company on the easterly side between Park street and Talbot avenue, and on the westerly side from Kerwin street to beyond Helen street, a total length of 806 feet.

Burt street, Washington street to Ashmont street, is about 1,365 feet long. The contract for constructing the surface of this street was awarded to Collins & Ham. Work under this contract was begun August 17, 1898, and suspended December 4, 1898.

Canal street, Haymarket square to Causeway street, is about 1,097 feet long. The contract for constructing the surface of the street was awarded to Jones & Meehan. Work under this contract was begun October 15, 1898, and suspended December 24, 1898.

Carlos street, Lauriat avenue to Chapman avenue, is about 300 feet long. The contract for constructing the surface of the street was awarded to Patrick O'Hara & Co. Work under this contract was begun July 5, 1898, and completed September 1, 1898, at a total cost of $788.38. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, gutter blocks and edgestones were furnished by the city and hauled to the site of the work by the contractors; flagging for crosswalks was furnished by the contractors.

Chamblet street, Hartford street to Magnolia street, is about 446 feet long. The contract for constructing the surface of the street was awarded to John Connors. Work under this contract was begun April 27, 1898, and completed May 23, 1898, at a total cost of $1,142.13. It is a 6-inch macadam road with artificial stone sidewalks (cost of sidewalks not included in the above cost). Crushed stone, gutter blocks and edgestones were furnished by the city and hauled to the site of the work by the contractor. Flagging for crosswalks was furnished by the contractor. Artificial stone sidewalks were laid by W. A. Murtfeldt Company.

Elizabeth street, Norfolk street to Astoria street, is about 264 feet long. The contract for constructing the surface of the street was awarded to Collins & Ham. Work under this contract was begun June 30, 1898, and completed August 18, 1898, at a total cost of $649.82. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor; gutter blocks were furnished on the work by the city, and flagging crosswalks were furnished by the contractor.

Fairmount street, Morton street to Washington street, is about 2,657 feet long. The contract for constructing the surface of the street was awarded to James McGovern. Work under this contract was begun November 16, 1897, and completed October 27, 1898, at a total cost of $7,084.51. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor; gutter blocks were furnished on the work by the city and flagging crosswalks were furnished by the contractor.

Hamilton street, Bowdoin street to Homes avenue, is about 944 feet long. The contract for constructing the surface of the street was awarded to James McGovern. Work under this contract was begun October 26, 1898, and suspended December 13, 1898.

Harold street, Munroe street to Walnut avenue, is about 748 feet long. A contract for constructing the surface of the street was awarded to Patrick McGovern. Work under this contract was begun November 21, 1898, and suspended December 1, 1898.

Hewins street, Columbia road to Erie street, is about 701 feet long. The contract for constructing the surface of the street was awarded to Philip Doherty. Work under this contract was begun September 13, 1898, and suspended November 30, 1898.

Jersey street, Brookline avenue to Audubon road, is about 1,782 feet long. A contract for filling this street to sub-grade was made with the Boston & Albany Railroad Company on August 24, 1898, at the rate of 51 cents per cubic yard, measured in the bank. Work was begun under this contract September 22, 1898, and completed December 17, 1898. Total amount of filling deposited was 36,897 cubic yards, at 51 cents per cubic yard, equal to $18,817.47. The contract for constructing the surface of the street has not been let.

Leedsville street, Adams street to Dorchester avenue, is about 564 feet long. The contract for constructing the surface of the street was awarded to Collins & Ham. Work was begun under this contract July 13, 1898, and completed September 2, 1898, at a total cost of $1,705.19. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractors; flagging for crosswalks was furnished by the contractors.

Leroy street, Geneva avenue to Ditson street, is about 717 feet long. The contract for constructing the surface of the street was awarded to Philip Doherty. Work was begun under this contract June 22, 1898, and completed August 4, 1898, at a total cost of $941.39, not including sidewalks. It is a 6-inch macadam road with artificial stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor; artificial stone sidewalks were laid by the Barnes Ruffin Company.

Lonsdale street, Dorchester avenue to Adams street, is about 1,626 feet long. The contract for constructing the surface of this street was awarded to Patrick O'Hara & Co. Work was begun under this contract August 23, 1898, and on September 30, 1898, P. O'Hara & Co. were notified that the city would complete the work on account of the contractors not carrying on the work in a satisfactory manner. A contract was then made with the Barnes Ruffin Company. Work was begun again October 10, 1898, and suspended December 28, 1898.

Malvern street, Brighton avenue to Ashford street, is about 702 feet long. The contract for constructing the surface of this street was awarded to James Doherty & Co. Work under this contract was begun July 8, 1898, and completed September 26, 1898, at a total cost of $1,691.21. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

Maryland street, Savin Hill avenue to Bay street, is about 474 feet long. The contract for constructing the surface of this street was awarded to Philip Doherty. Work under this contract was begun October 18, 1898, and suspended November 30, 1898.

Mellen street, Ocean street to Montague street, is about 759 feet long. The contract for constructing the surface of the street was awarded to Collins & Ham. Work was begun under this contract September 13, 1898, and completed November 28, 1898, at a total cost of $2,421.59. It is a 6-inch macadam road with artificial stone sidewalks, 4 feet in width and a planting space for grass between the sidewalk and the edgestone. Crushed stone and edgestones were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

Merlin street, Athelwold street to Park street, is about 465 feet long. The contract for constructing the surface of the street was awarded to Patrick McGovern. Work was begun under this contract September 15, 1898, and completed November 28, 1898, at a total cost of $1,794.97. It is a 6-inch macadam road with artificial stone sidewalks. Crushed stone and edgestone were furnished by the city and hauled to the site of the work by the contractor; gutter blocks were furnished on the work by the city; flagging for crosswalks was furnished by the contractor.

Nightingale street, Talbot avenue to Bernard street, is about 1,454 feet long. The contract for constructing the surface of this street was awarded to James Doherty & Co. Work was begun under this contract August 29, 1898, and completed December 13, 1898, at a total cost of $3,679.46, not including cost of artificial stone sidewalks. It is a 6-inch macadam road with crushed stone and artificial stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for

crosswalks was furnished by the contractor; artificial stone sidewalks were laid by Simpson Brothers' Corporation.

North Harvard street, Western avenue to Charles river, is about 2,573 feet long. The contract for constructing this street was awarded to Geo. H. Wentworth & Co. Work was begun under this contract October 4, 1898, and suspended December 24, 1898.

Oakley street, Bowdoin street to Geneva avenue, is about 825 feet long. The contract for constructing the surface of this street was awarded to John Connors. Work was begun under this contract July 11, 1898, and completed August 23, 1898, at a total cost of $1,327.01, not including the cost of artificial stone sidewalks. It is a 6-inch macadam road with artificial stone sidewalks. Crushed stone, edgestone and gutter blocks were furnished by the city, and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by contractor; artificial stone sidewalks were laid by John C. Newborg.

Peverell street, Sawyer avenue to Salcombe street, is about 486 feet long. The contract for constructing the surface of this street was awarded to Collins & Ham. Work was begun under this contract August 25, 1898, and suspended December 20, 1898.

Rosseter street, Bullard street to Bowdoin avenue, is about 849 feet long. A contract for constructing the surface of this street was awarded to Patrick O'Hara & Co. Work was begun under this contract June 14, 1898, and completed August 23, 1898, at a total cost of $1,917.80. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, straight edgestone and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; circular edgestone were furnished by the city on the work; flagging for crosswalks was furnished by the contractor. A contract for building retaining walls at estates of T. H. Badlam and F. E. Brown was awarded to R. L. Barrett for the sum of $1,275. Work was begun under this contract October 25, 1898, and suspended December 1, 1898.

Ruggles street, Parker street to Back Bay Fens, is about 945 feet long. A contract for constructing the surface of this street was awarded to Doherty & Connors. Work was begun under this contract December 2, 1897, and completed August 6, 1898, at a total cost of $5,420.99. It is a Telford macadam road (8 inches and 4 inches respectively) with crushed stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

St. Stephen street, St. Stephen street to Bryant street, is about 803 feet long. A contract for filling this street to subgrade was awarded to James T. Gilligan; 5,381 cubic yards were deposited at 20 cents per cubic yard, equal to $1,076.20. The contract for constructing the surface of the street has not been let.

Spencer street, Wheatland avenue to Talbot avenue, is about 625 feet long. A contract for constructing the surface of the street was awarded to James McGovern. Work under this contract was begun November 20, 1898, and suspended December 14, 1898.

Stuart street, Trinity place to Dartmouth street, is about 260 feet long. A contract for constructing the surface of this street was awarded to Collins & Ham. Work was begun under this contract October 7, 1898, and completed October 31, 1898, at a total cost of $767.02. It is a 6-inch macadam road with brick sidewalks. Crushed stone, edgestone and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; bricks for sidewalks were furnished on the work by the city; flagging for crosswalks was furnished by the contractor.

Telford street, Western avenue to Metropolitan Park Reservation, is about 349 feet long. A contract for constructing the surface of this street was awarded to James Doherty & Co. Work was begun under this contract August 9, 1898, and completed August 29, 1898, at a total cost of $568.95. It is a 6-inch macadam road with crushed stone sidewalks. Crushed stone, edgestone and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

Tonawanda street, Geneva avenue to Greenbrier street, is about 1,700 feet long. A contract for constructing the surface of this street was awarded to Philip Doherty. Work was begun under this contract October 11, 1897, and completed June 18, 1898, at a total cost of $5,294.52. It is a 6-inch macadam road with brick sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; bricks for sidewalks were furnished on the work by the city; flagging for crosswalks was furnished by the contractor.

Vancouver street, Huntington avenue to Ruggles street, is about 254 feet long. A contract for constructing the surface of this street was awarded to Doherty & Connors. Work was begun under this contract December 2, 1897, and completed August 6, 1898, at a total cost of $1,646.84. It is a Telford macadam road (8 and 4 inches respectively) with crushed stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the site of the work by the contractor; flagging for crosswalks was furnished by the contractor.

Waterlow street, Harvard to Harvard street, is about 518 feet long. A contract for constructing the surface of the street was awarded to James Doherty & Co. Work was begun under this contract October 4, 1898, and completed November 28, 1898, at a total cost of $1,200.46, not including the cost of artificial stone sidewalks. It is a 6-inch macadam road with crushed stone and artificial stone sidewalks. Crushed stone, edgestones and gutter blocks were furnished by the city and hauled to the

site of the work by the contractor; flagging for crosswalks was furnished by the contractor. The artificial stone sidewalks have not been laid.

Public Alley, No. 437, Arlington street to Berkeley street, between Commonwealth avenue and Newbury street, is about 596 feet long. A contract for constructing the surface of this alley was awarded to the Barber Asphalt Paving Company. Work under this contract was begun October 24, 1898, and completed December 16, 1898, at a total cost of $2,063.89. The roadway is paved with Trinidad lake asphalt 1½ inches thick, with a bituminous concrete binder 1½ inches thick, on a 6-inch American cement concrete base. The existing pavement (old cobble stone) was removed and roadway excavated, edgestones reset and brick sidewalks laid by the contractor. All new bricks and edgestones required were furnished by the city.

Contracts were awarded on the following streets, but at the end of the season no work had been done:

Angell street, Blue Hill avenue to Canterbury street.

Astor street, Massachusetts avenue to Parker street, now Hemenway street.

Fowler street, Greenwood street to Glenway street.

Francis street, Huntington avenue to Brookline avenue.

Middleton street, Norfolk street northerly.

Wensley street, Heath street westerly.

Plans have been prepared of the following "new streets" on which the work of construction has not been commenced:

Alexander street, Alexander street to Oleander street.

Amory street, School street to Bragdon street.

Atherstone street, Fuller street to Bailey street.

Belvidere street, Dalton street to West Newton street.

Bragdon street, Columbus avenue to Amory street.

Chiswick road, Englewood avenue to Chestnut Hill avenue.

Devon street, Blue Hill avenue to Columbia road.

Forest Hill street, Washington street to Glen road.

Homes avenue, Bowdoin street to Topliff street.

Idaho street, from River street.

Ipswich street, Boylston road to Boylston street.

Leeds street, Woodward street to Dorchester avenue.

Millet street, Park street to Athelwold street.

Newburg street, Beech street to Belgrade avenue.

Orkney road, Strathmore road to Sutherland road.

Peterborough street, Boylston road to Audubon road.

Queensberry street, Audubon road to Audubon road.

St. Stephen street, St. Stephen street to Bryant street.

Shirley street, Norfolk avenue to Massachusetts avenue.

Spencer street, Wheatland avenue to Talbot avenue.

Spring street, Centre street to Gardner street.

Stanley street, Quincy street to Bellevue street.

Thane street, Park street to Athelwold street.

Van Winkle street, Dorchester avenue to Shawmut branch railroad.

West Selden street, from Morton street.
Woodlawn street, Hyde Park avenue to Forest Hills cemetery.

GRADING STREET RAILWAY TRACKS.

The grades for tracks in the following streets have been determined. On streets marked ** the surveys were made and levels taken by the companies:

(*Boston Elevated Railway Company.*)

Alford street, Main street to Malden bridge.
Atlantic avenue, Summer street to Kneeland street.
Brattle street, Court street to Washington street.
Brighton street, Lowell street to Leverett street.
Bunker Hill street, Chelsea street to Sackville street.
Canal street, Haymarket square to Causeway street.
Columbus avenue, at Centre street.
Dorchester avenue, Summer street to Fort Point channel.
Hanover street, Court street to Washington street.
Main street, Mead street to Mystic branch railroad.
Neponset avenue, Minot street to Taylor street.
Shawmut avenue, Cherry street to near Castle street.
Shawmut avenue, Tremont street to Pleasant street.
Summer street, Atlantic avenue to Dorchester avenue.
Washington street, at Columbia road.

(*West Roxbury and Roslindale Street Railway Company.*)

Spring street, Centre street to Gardner street.

(*Newtonville and Watertown Street Railway Company.*)

****North Beacon street,** Union square to Charles river.

Total length of single track grades 6.9 miles.

Surveys and plans were made for work upon the following streets and grades and lines given. The work of construction was supervised by the Street Department:

Adams street, Park street to Parkman street.
Alford street, Main street to Malden bridge.
Commonwealth avenue, at Essex street.
Commonwealth avenue, Warren street to Chestnut Hill avenue.
Covington street, East Eighth street to foot of steps.
Neponset avenue, Minot street to Neponset river.
Washington street, West Walnut park to School street.

BROADWAY BRIDGE OVER FORT POINT CHANNEL.

Plans were made for strengthening portions of the draw fender pier of this bridge; the work was done by the Street Department.

Columbia Road.

Columbia road construction has been in progress during the year. The first section extending from Blue Hill avenue to Stanwood street has been completed, and the prospect is good that the work will be finished to Edward Everett square in the time allowed in the two remaining contracts, on or before July 1, 1899. No work has been done on the bridge at the crossing of the New York, New Haven & Hartford Railroad.

The filling done during the year, other than that done by the Park Department, has been at the foot of Mercer street and along Ninth street. About 21,000 cubic yards of earth have been deposited at the foot of Mercer street under several small contracts, the material having been brought from the hills of South Boston.

On October 25, 1898, a contract was made with Simon J. Donovan for filling that portion of Columbia road between Atlantic and I streets. Under this contract 16,267 cubic yards have been deposited.

On December 28 another contract was made with Mr. Donovan for filling the section of the road between Mercer and Mt. Vernon streets, and building an extension of the culvert under the railroad. A small amount of filling has been done and work begun on the culvert.

On October 10, 1898, a contract was made with Dennis F. O'Connell for building the abutments and pier of the bridge to carry Columbia road over the New York, New Haven & Hartford Railroad, and also over the new Columbia avenue. The foundations and about one-half of the stone masonry have been built and the excavation made for the pier.

Cottage Farm Bridge over Boston & Albany Railroad.

A granolithic sidewalk has been built on the northerly side of this bridge, the concrete foundation of which was furnished by the Metropolitan Construction Company, and the granolithic surface was laid by Simpson Brothers. Iron fences, furnished and set by P. J. Dinn & Co., have been placed on the main girders of the bridge.

Dumping Wharves for the Sanitary Division.

Plans and specifications were made for widening and dredging the dock at Fort Hill Wharf and a contract for doing the work was made June 15, 1898, with W. H. Ellis.

The total cost was $3,376, and the work was completed early in September.

Plans and specifications were made for building a high platform over this dock for the purpose of dumping garbage into scows below. The work was done by W. H. Ellis, for the sum of $2,843.33, and was completed in October.

Plans and specifications were made for building a platform and incline runway at the Sanitary Wharf on Albany street and the contract for doing the work was awarded to Thomas E. Ruggles on November 30, for the sum of $5,470. The platform is over the dock, and is to be used for similar purposes to the one at Fort Hill Wharf; this work is not yet completed. Previous to the building of this platform the dock and its entrance were dredged by the Eastern Dredging Company to grade — 7.0 feet city base; the contract price for doing this work was $1,260.

East Boston Ferries.

New drops and tanks. — Plans and specifications were made for building two new drops, and a contract was made September 3, 1898, with John M. Brooks for doing the work for the sum of $5,775 for each drop. Plans and specifications were also made for building two new tanks for supporting the drop, and a contract for doing the work was made with Mr. Brooks for the sum of $1,875 for each tank. One drop replaced the old northerly drop at the Boston landing of the North Ferry, and was open to travel January 14, 1899; the other drop is to replace the old northerly drop at the East Boston landing of the South Ferry, and will be thrown open for travel early in February.

Harvard-street Bridge over New England Railroad.

Plans were prepared for building an 8-ft. sidewalk for this bridge, and the work was done by the Street Department.

Ipswich-street Bridge and Retaining-wall.

On account of the laying out of this street across the Fens the following structures were required:

A retaining-wall on the northerly line of the street, which line was also the southerly line of the location of the Boston and Albany Railroad, for a length of 530 feet easterly from the easterly line of the Fens.

A bridge over the Fens waterway and a bridge to carry

the park driveway in Charlesgate West over Ipswich street. All the masonry work in these structures was built under a contract with Messrs. Holbrook, Cabot and Daly, dated November 29, 1897, and the work was completed on September 13, 1898, at a total cost of $40,528.99.

The retaining-wall along the railroad serves to support the street, and has a height above the railroad varying from 1 foot 6 inches to 6 feet and a length of 530 feet. It is a rubble wall with a cut coping 2 feet wide by 1 foot 6 inches high. Owing to the small height of this wall no piles were used, the foundation extending only 4 feet below the grade of the railroad.

The bridge over the waterway, so far as the masonry is concerned, is an extension of the abutments and piers of the bridge on the railroad. The foundation consists of a pile and timber platform extending the full width of the waterway and abutments, the upstream end being protected by a line of 4-inch sheet piling. The platform is at grade —0.5 and the tops of the piers are at grade 12.25. There are two piers each 3 feet wide and three openings for the waterway each 17 feet wide. A supplementary agreement was made with the contractors for the masonry for building the superstructure of this bridge except the railing. The bridge is built of steel beams of depths varying, to conform to the crown of the roadway, from 10 inches in the gutter to 20 inches on the outer lines of the bridge; they are spaced from 2 feet to 3 feet 2 inches apart; the spaces between the beams and above them to within 2½ inches of the surface of the street are filled with Portland cement concrete; sheets of expanded metal are imbedded in the concrete 2 inches above the under surface, this surface being flush with the bottoms of the beams; on top of the concrete an asphalt covering was laid 2½ inches thick. There is a sidewalk 8 feet in width on the southerly side of the bridge, but none on the northerly side, a curb being placed on this side one foot from the outer line. The depth of the bridge is 20 inches on the outside lines, 19 inches at the sidewalk curb and 14 inches in the gutter. The surface of the bridge is 61 feet in length by 50 feet in width.

For building the bridge on Charlesgate West it was necessary to remove a portion of the old retaining-wall on the easterly line of the Parkway, and the whole of the wall on the westerly line of the Parkway down to the sub-grade of Ipswich street, excavate the earth within the lines of the new street and the bridge abutment, build a new face on the back of the abutment of the bridge over the railroad and build

a new abutment on the southerly line of the new street. The Parkway was originally graded by filling with coarse gravel from the original grade of the flats, which was about grade 2, to grade 34. Borings taken after the required excavation was made, showed that the soft mud underneath the filling, which previous to the filling was 14 feet in depth, had been either compressed or displaced so that the filling extended down to grade —6.

Great difficulty was experienced in driving the piles for the abutment on account of the character of the filling; where the attempt was made to drive all of the piles called for by the plan it is probable that not more than one-half of them reached the natural hard bottom which was at grade —28. The piles were driven in a trench excavated to grade 4 or about 10 feet below the grade of the ground in front of the abutment and about 26 feet below the undisturbed surface in the rear of the abutment. Many of the piles were broken in driving, and some that were drawn up after being driven were found crippled and broomed at the points. A water jet was tried, but the filling was so coarse that the jet had no effect upon it; iron shoes were used on the piles, but still they were crippled; finally only every alternate pile was driven and these seemed to reach hard bottom and to so compact the material that no more piles could be driven. The piles were spaced, according to the plan, 2 feet apart on centres in each direction, there being 9 piles in each row at right angles to the face of the abutment; 329 piles were driven out of 621 called for by the plan. No settlement has been detected in the masonry. It is probable that the great weight of the filling 38 feet in depth which has rested on the mud for the past 15 years has so consolidated it that it is able to support the masonry with the help of a smaller number of piles than would otherwise be necessary.

The abutment is 106 feet in length at the ground line and has a retaining or wing-wall returned on the westerly line of the Parkway, a distance of 35 feet, for the purpose of preventing the filling on the Parkway from encroaching on the street. The easterly end of the abutment is connected with the old retaining-wall. The foundation is 18 feet wide, projecting at the bottom 6 feet 6 inches in front of the exposed face of the abutment. The piles were cut off 1 foot above the bottom of the trench or at grade 5. The masonry from grade 4 to grade 11 was of American cement concrete composed of 1 part cement, 2 parts of sand and 5 parts of gravel. The concrete had a width on top of 14 feet 8 inches, the front line being 3 feet 2 inches in front of the exposed face

of the wall. On this was laid a footing course of granite 2 feet thick and 13 feet wide, projecting 2 feet in front of the wall above it.

The masonry above the footing course is of quarry-faced Rockport granite laid in horizontal courses in American cement mortar with 1-inch joints. The back of the old abutment of the bridge over the railroad was faced with quarry-faced ashlar, by cutting away the backing of the two lower courses sufficiently to allow laying two courses of stretchers above the old foundation; the lower course was bolted to the backing of the same course by two 1¼-inch bolts to each stone and this course and the next two above it were clamped to the old work by two ½-inch wrought iron clamps to each stone. The bridge seat courses of both abutments are of cut stone 2 feet rise and 5 feet wide; these are surmounted by cut stone parapets, the tops of which conform to the shape of the roadway and walks. Ballast of quarry chips was placed in the rear of the abutment.

A temporary wooden bridge was erected to carry the park drive over the street at a cost of $565.57, and the drive was opened to travel on July 13.

On July 25, 1898, a contract was made with the James Russell Boiler Works Company for building iron fences on each side of Ipswich street across the Fens. On the waterway bridge there is a railing 3 feet 6 inches high of three 2-inch wrought iron pipes with cast iron posts; the remainder of the fence consists of two rails of 2½-inch × ½-inch wrought iron posts of 2½-inch × 1-inch wrought iron set in cast iron bases, and palings of ¾-inch round iron spaced 4½ inches apart; the fence is 6 feet high. The work was completed on November 7, at a cost of $889.

NORTH END PAVING WHARF.

A plan was made for an extension of this wharf to the harbor line; this work has not yet been done.

WARREN BRIDGE.

Plans were made for a temporary platform to be used for dumping snow; it has not been built.

MISCELLANEOUS WORK AND CONSTRUCTION IN 1898.

BROADWAY BRIDGE OVER FORT POINT CHANNEL.

Plans were made for rebuilding and strengthening portions of the draw pier of this bridge. The work was done by the Street Department.

CANAL BRIDGE.

Plans and specifications were made for rebuilding the down-stream sidewalk on the Cambridge side of this bridge for a distance of 397.60 feet from the draw. The work was done by William H. Ellis, under his contract, dated May 12, 1898. The work was completed June 13, at a cost of $2,397.26.

COLUMBIA ROAD.

See page 100.

CONGRESS-STREET GRADE CROSSING.

The abutments and piers for the fixed spans of the bridge across Fort Point channel have all been built during the year under contracts with Ross & Fowler. The west abutment, with the exception of the parapet, was finished in March, 1898, and the parapet put on during the following November. The four piers in the channel and the east abutment were finished in December, 1898. The abutments for the bridge over A street were also built by Ross & Fowler under a contract dated August 9, 1898, and were completed in December last. The abutments and pier for the bridge over C street and the easterly abutment for the bridge over B street are now being built under a contract with James McGraw & Co., and should be completed early in the spring. Timber bulkheads for supporting the filling on the southerly side of Summer street, between A street and Fort Point channel and on both sides of the approach from A street, are now being constructed under a contract with Ross & Fowler, and will be completed in March. Con-

tracts have also been made with W. J. Lawler for building the foundations for the draws and the necessary draw piers, requiring the work to be done before April 15, 1899, and with the A. & P. Roberts Company for the superstructure of the fixed spans of the bridge across the channel calling for its erection before May 1, 1899. Proposals for building the two retractile draws have been called for requiring the draws to be in place on or before July 1, 1899, and it is confidently expected that if all the work now under contract is completed within the time specified the portion of Summer street as far as A street and the approach from that street will be ready for traffic early in July next.

About 600 feet in length of the new street extending westerly from L-street bridge has been paved, the edgestone set, sidewalks and fences built, and the necessary sewers and drains constructed. A large amount of filling has also been deposited along the line of the street wherever it could be done without interfering with other work. The sea-wall called for by the decree along the widening on the northerly line of Congress street has been built under a contract with W. L. Miller, for the sum of $20,495.

Under one of the conditions imposed in the license granted by the Board of Harbor and Land Commissioners for doing this work, a channel, 50 feet wide, has been dredged to a depth of 16 feet at low water, extending from Congress-street bridge to Mt. Washington-avenue bridge. This work was done by the Eastern Dredging Company at a cost of $2,245.

COTTAGE FARM BRIDGE.

See page 100.

DORCHESTER–AVENUE GRADE CROSSING.

Plans have been made for the abutments of the proposed bridges on Boston and Swett streets and Dorchester avenue. On January 16, 1899, a contract was made with Holbrook, Cabot & Daly for building the abutments of the bridge on Boston street; but no work has as yet been done on the ground.

DORCHESTER AVENUE, SUMMER STREET AND ATLANTIC AVENUE EXTENSIONS.

The work on these streets made necessary by the erection of the South Union Station has been prosecuted vigorously during the year, and they are open for traffic.

The contract for the third section of the sea-wall along the harbor line between Mt. Washington avenue and the old

abutment of Federal-street bridge was made with William H. Ryan, under date of February 17, 1898, and the wall was finished, including the coping, late in September. The coping on the other sections of the sea-wall was set early last spring, and the work at Mt. Washington-avenue bridge was completed in July, 1898. A temporary wooden fence has been built along the wall from Federal-street bridge to Summer street, which will protect travel until an iron fence can be built this spring.

The work of setting edgestone, building catch-basins, and paving on Dorchester avenue and Summer street was begun on March 30, 1898, and a roadway, 40 feet in width, was open to travel on June 8, 1898, from Mt. Washington avenue to Atlantic avenue. This roadway was extended to Federal-street bridge, and all traffic diverted from old Federal street on July 11, 1898.

The work of paving Dewey square and Atlantic avenue as far as Kneeland street, excepting a narrow strip in front of the proposed buildings for express purposes, was finished early in December.

The entire width of Dorchester avenue from Summer street to the southerly end of the new station was paved and opened to travel on December 23, 1898.

Brick sidewalks have been built on both sides of Summer street, from Dewey square to Dorchester avenue, excepting a short length on the northerly side adjoining the property of the Boston Electric Light Company. A brick sidewalk has also been built on Atlantic avenue along the westerly side of the new station.

DUMPING WHARVES, SANITARY DIVISION, STREET DEPARTMENT.

See page 100.

EAST BOSTON FERRIES.

See page 101.

FEDERAL-STREET BRIDGE WIDENING.

As stated in the last annual report, plans and specifications were prepared for widening the Boston end of Federal-street bridge at the part adjoining Dorchester-avenue extension. A contract was made on May 31, 1898, with Wm. J. Lawler, for doing the work for the sum of $10,206, and the work was completed early in September.

HARVARD-STREET BRIDGE OVER N. E. R.R.

See page 101.

Hayes Square.

This square is formed by the intersection of Bunker Hill, Vine and Moulton streets in Charlestown. A triangular area of about 5,000 square feet is not included within the street lines, and is in the charge of the Department of Public Grounds. The curbstone purchased during the preceding year were set in the spring, an iron fence was furnished and set on the curb by George T. McLauthlin & Co. The whole work was finished on July 26.

Ipswich Street.

See page 101.

North End Paving Wharf.

See page 104.

Roxbury High Fort.

This work was completed on July 6, so far as the appropriation would allow. The work done was to complete the grading of the fort itself, to loam and seed the slopes, make a macadam surface on the area inside the fort, build two additional flights of steps, construct the driveway from Beech Glen avenue to the fort, build a walk on the westerly side of the hill below the fort, remove and place in a new position the memorial stone, and to clean up and leave in a respectable condition the whole park; much, however, remains to be done to give the whole ground a finished appearance. All of the work except the building of the steps and the moving of the memorial stone was done by a force detailed from the Street Department. The masonry work was done by A. A. Libby & Co.

Swimming Pools.

A swimming pool on Orchard park was finished so as to be opened to the public on July 3. This pool is simply an excavation in clayey ground, lined with Portland cement concrete, and having an artificial stone walk 4 feet wide around the outside, sloping away from the tank. The tank is 80 feet long by 30 feet wide, 4 feet deep at one end and 4 feet 6 inches deep at the other end. The side walls are 2 feet, and the bottom 6 inches thick. The sides and bottom were plastered with Portland cement, and then washed with clear Portland cement wash. Suitable drains for emptying the tank with an overflow 6 inches below the top of the tank were constructed. A 4-inch water-supply pipe enters the middle of the shallow end of the tank 2 feet above the bottom.

Another swimming pool was built in the old bath-house on Cabot street. This is 66 feet long, 23 feet wide, 3 feet 6 inches deep at one end, and 6 feet 6 inches deep at the other end; no artificial stone walk was laid around it; owing to the character of the soil the bottom of this tank was made 16 inches thick. The drainage from the tank is into Stony brook. With the above exceptions the tank was constructed in the same manner as was the one at Orchard park. It was finished on August 4.

TEMPORARY HIGHWAY BRIDGE ACROSS CHARLES RIVER.

Plans were made and approved by the War Department for building this bridge, which is about 300 feet south of West Boston Bridge with approaches connecting with the present lines of travel; the whole bridge will be about 2,248 feet long, and will be provided with two draws. This bridge is designed to take the travel now going over West Boston bridge until the new bridge, to be called Cambridge bridge, is completed.

Plans and specifications were made for building 1,920 feet of this bridge, and a contract for doing the work was made with Benjamin Young, October 13, for the sum of $32,200; the draws, draw-piers and adjoining parts of the bridge not being included; about two-thirds of the piles have been driven, and about 30 per cent. of the top work has been done.

VOTING–BOOTHS.

At the request of the Election Commissioners plans and specifications for building iron voting-booths were revised, and their construction was inspected by this department.

WARREN BRIDGE.

See page 104.

MISCELLANEOUS.

Estimates have been made of the cost of restoring the old fort on Dorchester Heights, of extending the channel of Stony brook and of abolishing the grade crossings on Blue Hill avenue and Oakland street at Mattapan.

Reports have been made on the condition of the retaining-wall on Adams street, at Cedar Grove cemetery, and on the improvement of Stony brook at Pierce farm, West Roxbury.

WIDTHS OF DRAW–OPENINGS.

The widths of draw-openings in the bridges over tide-water in this city have all been remeasured for this report.

APPENDIX A. — Table showing the widths of openings for vessels in all bridges provided with draws.

APPENDIX B. — Table of accident and other plans made for the Law Department.

APPENDIX C. — Table of surveys, plans and profiles made by Surveying Division.

APPENDIX D. — List of streets where lot frontages have been obtained for Sewer Division, Street Department, for sewer assessments.

APPENDIX E. — Engineering Department property schedule.

APPENDIX F. — Elevations referred to Boston City base.

APPENDIX G. — Engineering Department Annual Reports, 1867–1898.

Respectfully submitted,

WILLIAM JACKSON,
City Engineer.

CITY ENGINEERS.

1850–1898.

E. S. CHESBROUGH, M. Am. Soc. C. E.,
November 18, 1850, to October, 1855.
(Died August 18, 1886.)

JAMES SLADE,
October 1, 1855, to April 1, 1863.
(Died August 25, 1882.)

N. HENRY CRAFTS,
April 1, 1863, to November 25, 1872.

JOSEPH P. DAVIS, M. Am. Soc. C. E.,
November 25, 1872, to March 20, 1880.
(Resigned March 20, 1880.)

HENRY M. WIGHTMAN, M. Am. Soc. C. E.,
April 5, 1880, to April 3, 1885.
(Died April 3, 1885.)

WILLIAM JACKSON, M. Am. Soc. C. E.,
April 21, 1885, to the present time.

APPENDIX A.

Table showing the Widths of Openings for Vessels in all Bridges provided with Draws, in the City of Boston, January, 1899.

Name of Bridges.	Location.	Number of Openings.	Width.	
			Feet.	In.
Boston & Maine R.R.	Boston to Charlestown	1	39	7
" " "	Over Miller's river	1	35	10
Broadway	Over Fort Point channel	1	43	3
Cambridge-st.	Brighton to Cambridge	1	36	4
Canal	Boston to East Cambridge	1	36	0
Charles-river	Boston to Charlestown	1	36	0
Chelsea (South channel)	Charlestown to Chelsea	1	38	9
" (North ")	" " "	1	44	10
Chelsea-st. (East Boston side)	East Boston to Chelsea	2	36	0
" (Chelsea side)	" " "	. . .	36	0
Commercial-point	Dorchester	1	24	0
Congress-st. (Boston side)	Over Fort Point channel	2	43	3
" (South Boston side)	" " "	. . .	43	9
Dover-st.	" " "	1	37	0
Eastern R.R.	Boston to Charlestown	1	39	8
" "	Over Miller's river	1	35	6
Essex-st.	Brighton to Cambridge	1	35	9
Federal-st.	Over Fort Point channel	1	41	10
Fitchburg R.R.	Boston to Charlestown	1	36	0
Fitchburg R.R. (for teaming freight)	" "	1	36	0

Grand Junction R.R.	Brighton to Cambridge	1	35 9
" "	East Boston to Chelsea	1	34 6
Granite	Dorchester to Milton	1	36 0
Harvard (Boston side)	Boston to Cambridge	2	36 6
" (Cambridge side)	" " "		36 10
L-st.	Over Reserve Channel, South Boston	1	40 0
Lowell R.R. (freight)	Boston to East Cambridge	1	40 2
" " (passenger)	" " " "	1	39 7
Malden	Charlestown to Everett	1	43 2
Meridian-st. (East Boston side)	East Boston to Chelsea	2	59 2
" (Chelsea side)	" " " "		59 0
Mt. Washington-ave. (Boston side)	Over Fort Point channel	2	42 3
" " (South Boston side)	" " "		42 3
Neponset	Dorchester to Quincy	1	36 0
New York & New England R.R. (Boston side)	Over Fort Point channel	2	41 5
" " " (South Boston side)	" " "		40 4
" " "	Over South Bay	1	28 4
North Beacon-st.	Brighton to Watertown	1	30 3
North Harvard-st.	Brighton to Cambridge	1	36 0
Old Colony R.R.	Over Fort Point channel	1	36 3
" "	Dorchester to Quincy	1	35 10
Prison Point	Charlestown to Cambridge	1	36 0
Warren	Boston to Charlestown	1	36 0
West Boston (Boston side)	Boston to Cambridge	2	35 6
" (Cambridge side)	" " "		36 6
Western-ave.	Brighton to Cambridge	1	36 0
"	Brighton to Watertown	1	35 10

APPENDIX B.

TABLE OF ACCIDENT AND OTHER PLANS MADE FOR THE LAW DEPARTMENT, FROM FEBRUARY 1, 1898, TO FEBRUARY 1, 1899.

BOSTON PROPER.

Ashburton place. — Plan of street in front of No. 11.
Beach street. — Plan of street at corner of Harrison avenue.
Beverly street. — Plan of street near Causeway street.
Blackstone street. — Plan of street in front of Nos. 91 and 93.
Boylston street. — Plan of street in front of No. 480.
Brighton street. — Plan of street in front of Nos. 38 and 44.
Cambridge street. — Plan of street in front of No. 387.
Central street. — Plan of street near No. 51.
Chambers street. — Plan of street in front of No. 17.
Chandler street. — Plan of street in front of No. 126.
Charles street. — Plan of street at corner of Beacon street.
Columbus avenue. — Plan of avenue in front of Nos. 243 and 245.
Columbus avenue. — Plan of avenue in front of No. 306A.
Commercial street. — Plan of street at corner of Battery street.
Compton street. — Plan of street in front of No. 33.
Corning street. — Plan of street in front of Nos. 5 and 7.
Cortes street. — Plan of street in front of Nos. 34 and 36.
Court square. — Plan of square in front of No. 30.
Court street. — Plan of street in front of No. 104.
Creek square. — Plan of street in rear of Nos. 2 and 4.
Dartmouth street. — Plan of street in front of No. 31.
Davis street. — Plan of street in front of No. 1.
Devonshire street. — Plan of street at Dock square.
Eliot street. — Plan of street in front of Nos. 14 and 16.
Eliot street. — Plan of street in front of Nos. 105 and 109.
Essex street. — Plan of street in front of No. 107.
Hanover street. — Plan of street in front of Nos. 176 and 178.
Harrison avenue. — Plan of street in front of No. 892.
Harvard street. — Plan of street in front of No. 134.
Huntington avenue. — Plan of street at corner of Norway street.
Kneeland street. — Plan of street at Lincoln street.
Massachusetts avenue. — Plan of street in front of No. 406.
Newland street. — Plan of street near Upton street.
North street. — Plan of street in front of Nos. 87 and 89.
Pearl street. — Plan of street near Milk street.

Pemberton square. — Plan of street in front of No. 9.
Richmond street. — Plan of street in front of No. 18.
Salem street. — Plan of street in front of No. 104.
Savoy street. — Plan of street in front of No. 14.
Shawmut avenue. — Plan of street in front of No. 289.
St. James avenue. — Plan of street in front of Nos. 27 and 29.
St. James avenue. — Plan of street at Trinity place.
Summer street. — Plan of street near Federal street.
Travers street. — Plan of street near Portland street.
Tremont street. — Plan of street at corner of School street.
Tremont street. — Plan of street at Milford street.
Tremont street. — Plan of street at Tremont Theatre.
Tremont row. — Plan of street in front of No. 8.
Union park. — Plan of street near Montgomery street.
Warren avenue. — Plan of avenue near bridge.
Washington street. — Plan of street in front of Nos. 636 and 638.
Washington street. — Plan of street in front of Nos. 495 and 501.
Washington street. — Plan of street at corner of Winter street.
Way street. — Plan of street in front of No. 41.
West Rutland square. — Plan of street in front of Nos. 89 and 91.
West Springfield street. — Plan of street in front of Nos. 200 and 202.
Yarmouth street. — Plan of street in front of Nos. 5 and 7.

SOUTH BOSTON.

Bolton and Third streets. — Plan of buildings between 215 Bolton street and 244 Third street.
Broadway. — Plan of street at Dorchester street.
F street. — Plan of street in front of No. 153.
Fourth street. — Plan of street in front of No. 554.
K street. — Plan of street in front of No. 14.

EAST BOSTON.

Saratoga street. — Plan of street in front of Nos. 151 and 153.

ROXBURY.

Cabot street. — Plan of street near Windsor street.
Centre street. — Plan of street in front of No. 8.
Columbus avenue. — Plan of avenue near Orange court.
Delle avenue. — Plan of avenue in front of No. 3.
Fellows street. — Plan of street near Orange court.
Francis street. — Plan of street near Binney street.
Kendall street. — Plan of street in front of No. 55.
Linden Park street. — Plan of street in front of No. 121.
Renfrew street. — Plan of street from Eustis street to Harrison avenue.

St. Alphonsus street. — Plan of street near Alleghany street.
Weston street. — Plan of street at corner of Tremont street.

DORCHESTER.

Ashmont street. — Plan of street near Neponset avenue.
Gibson street. — Plan of street near Dorchester avenue.
Rockwell street. — Plan of street near Washington street.
Talbot avenue. — Plan of avenue near Railroad bridge.
Talbot avenue. — Plan of avenue at corner of Nightingale street.

WEST ROXBURY.

Jamaica street. — Plan of street in front of No. 94.
Washington street. — Plan of street near Grove street.

BRIGHTON.

Franklin street. — Plan of street, corner of Allcott street.

APPENDIX C.

TABLE OF SURVEYS, PLANS AND PROFILES MADE BY THE SURVEYING DIVISION OF THE ENGINEERING DEPARTMENT, FROM FEBRUARY 1, 1898, TO FEBRUARY 1, 1899.

Boston Proper.

Aldine street. — Gilbert street to Hathaway place. Plan and profile for proposed grade.

Allen street. — Plan and profile of edgestone for proposed grade.

Andrew street. — East Canton street to East Dedham street. Plan and profile for proposed laying out and established grade.

Ash street. — Bennet street to Nassau street. Plan and profile of edgestone for proposed grade.

Asylum street. — Washington street to Harrison avenue. Plan and profile of proposed laying out and established grade.

Atlantic avenue. — East street to Kneeland street. Plan for proposed discontinuance.

Atlantic avenue. — Kneeland street to Dorchester avenue. Approximate plan for proposed extension.

Atlantic avenue. — Kneeland street to Fort Point channel. Plan and profile for extension and established grade.

Bay street. — Off Fayette street. Plan and profile of edgestone for proposed grade.

Beach street. — Approximate plan for widening.

Belvidere street. — Falmouth street to Dalton street. Plan and profile of edgestone for proposed laying out and established grade.

Bennet place. — Off Bennet street. Plan and profile for proposed laying out.

Blandford street. — Commonwealth avenue to Boston and Albany Railroad. Plan and profile for proposed laying out and established grade.

Boston Common. — At Frog pond. Plan and profile across end through fountain.

Boston Common. — Plan for proposed bicycle path.

Broadway. — Albany street to Fort Point channel. Plan and profile of edgestone for proposed grade.

Cambridge street. — Charles street to Charles river. Plan for proposed widening.

Cambridge street. — Corner Charles street. Plan of estate.

Canal street. — Plan showing relocation.

Causeway street. — Beverly street to Prince street. Plan and profile for established grade.

Chardon street. — Southeasterly side, Court street to Hawkins street. Plan and profile of edgestone for proposed grade.

Charles river. — Plan of boat landing proposed for the Boston Parks Service Company.

Charles river. — Plan of 30-foot street on, for proposed laying out.

Charles River avenue. — Causeway street to Charles river. Plan and profile for established grade.

Charlestown street. — Causeway street to Stillman street. Plan and profile for widening and established grade.

City Hospital. — Massachusetts avenue and Harrison avenue. Plan showing new building and Nurses' Home.

Clarendon street. — St. James avenue to Columbus avenue. Plan and profile for proposed extension and established grade.

Columbus avenue. — Corner Clarendon street. Sketch of plumbing of tower and heights for Building Department.

Commercial street. — Prince street to Hull street. Plan and profile for revised and established grade.

Cooper street. — Charlestown street to North Margin street. Plan and profile of edgestone for proposed grade.

Corn court. — Plan for proposed laying out.

Court street. — Easterly side, Alden street to Chardon street. Plan and profile of edgestone for proposed grade.

Dartmouth street. — Southerly corner Harwich street. Plan and profile to see what grade can be given.

Dorchester avenue. — Junction of Federal street. Plan for proposed widening and discontinuance.

East Concord street. — Washington street to Harrison avenue. Plan and profile of edgestone for proposed grade.

Endicott street. — Causeway street to Thacher street. Plan and profile for established grade.

Essex street. — South street to Federal street. Plan and profile for widening and established grade.

Estes place. — Summer street to Congress street. Plan and profile for proposed laying out and established grade.

Fargo street. — Plan for proposed extension to Summer street.

Gainsboro' street. — St. Stephen street to Hemenway street. Plan and profile for proposed laying out and established grade.

Hammond avenue. — Leverett street to Chambers street. Plan and prolfie for proposed grade.

Hammond avenue. — Plan of, to show lines.

Hull street. — Plan and profile of edgestone for proposed grade.

Lewis street. — Corner North street. Plan for Superintendent of Streets.

Lyman street. — Plan for discontinuance of portion.

Medford street. — Charlestown street to Causeway street. Plan and profile for established grade.

Melrose street. — Pleasant street to Ferdinand street. Plan and profile of edgestone for proposed grade.

Milton place. — Summer street to Federal street. Plan and profile for proposed laying out and established grade.

Pembroke street. — Plan of proposed addition to school lot.

Prince street. — Commercial street to Lafayette avenue. Plan and profile for established grade.

Public Alley. — Between Sawyer street and Kendall street. Plan and profile for proposed laying out and established grade.

Public Alley. — From Oliver street. Plan and profile for proposed laying out.

Public Alley. — From Norman street. Plan and profile for proposed laying out.

Public Alley No. 100. — (Brighton-street avenue) Auburn street to Brighton street. Plan and profile for laying out and established grade.

Public Alley No. 101. — (Chair alley) Richmond street to Cross street. Plan and profile for proposed laying out and established grade; also plan for relocation.

Public Alley No. 102. — (Hancock row) Creek square to Marshall street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 201, 202, 203, 204. — (Bang alley) Doane street to Central street. Plan and profile for proposed laying out and established grade.

Public Alley No. 301. — (River street and River-street place) Mt. Vernon street to Pinckney street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 401, 402, 403, 404, 405. — Between Huntington avenue and St. Botolph street, from Irvington street to Massachusetts avenue. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 414, 415, 416, 417. — Between Beacon street and Marlboro' street, from Exeter street to Massachusetts avenue. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 418, 419, 420. — Between Beacon street and Marlboro' street, from Exeter street to Berkeley street. Plan and profile for proposed laying out and established grade.

Public Alley No. 421. — Between Beacon street and Marlboro' street, from Berkeley street and Arlington street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 422, 424, 425, 426, 427. — Between Marlboro' street and Commonwealth avenue, from Arlington street to Gloucester street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 428, 429. — Between Marlboro' street and Commonwealth avenue, from Gloucester street to Massachusetts avenue. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 430, 431, 432, 433. — Between Newbury street and Commonwealth avenue, from Massachusetts avenue to Exeter street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 434, 435, 436, 437. — Between Commonwealth avenue and Newbury street, from Arlington street to Exeter street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 438, 439, 440. — Between Newbury street and Boylston street, from Arlington street to Exeter street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 441, 442, 443, 444. — Between Newbury street and Boylston street, from Exeter street to Massachusetts avenue. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 601, 602. — (Oxford place) from Harrison avenue. Plan and profile for proposed laying out and established grade.

Public Alley No. 603. — (Oliver place) Essex street to Beach street. Plan and profile for proposed laying out and established grade.

Public Alley Nos. 604, 605, 606. — (May place) between Oak street and Nassau street. Plan and profile for proposed laying out and established grade.

Public Alley No. 607. — (Bennet place) off Bennet street. Plan and profile for laying out and established grade.

Public Alley Nos. 608, 609. — (Maple place) Oak street to Harrison avenue. Plan and profile for proposed laying out and established grade.

Public Alley No. 611. — (Lovering place) Washington street to Harrison avenue. Plan and profile for proposed laying out and established grade.

Public Alley No. 701. — Between Union Park and Upton street, from Shawmut avenue to Tremont street. Plan and profile for proposed laying out and established grade.

Public Alley No. 702. — West Springfield street to Worcester street. Plan and profile for proposed laying out and established grade.

Public Alley No. 703. — Newland street to No. 702. Plan and profile for proposed laying out and established grade.

Roosevelt street. — From Northampton street to Camden street. Plan and profile to test grade.

St. James avenue. — Corner Trinity place. Sketch showing height of building in process of construction for Building Department.

St. James avenue. — Clarendon street to Trinity place. Plan and profile of edgestone for proposed grade.

Sears street. — Central Wharf to India street. Plan and profile for proposed laying out and established grade.

Sheafe street. — Salem street to Snowhill street. Plan and profile of edgestone for proposed grade.

South street. — Northwesterly side, Essex street to Tufts street. Plan and profile of edgestone for proposed grade.

Stanhope street. — Morgan street to end. Plan and profile for revised grade.

Summer street. — Southerly side, South street to Atlantic avenue. Plan and profile of edgestone for proposed grade.

Thacher street. — Charlestown street to North Margin street. Plan and profile of edgestone for proposed grade.

Trinity place. — St. James avenue to Stanhope street. Plan and profile of proposed laying out and established grade.

Tufts street. — South street to Lincoln street. Plan and profile of edgestone for proposed grade.

Tyler street. — Curve street to Harvard street. Plan and profile of edgestone for proposed grade.

Wareham street. — Corner Harrison avenue. Plan of Estate line.

Warrenton place. — Tremont street to Pleasant street. Plan and profile for proposed laying out and established grade.

Washington street. — Nos. 1734 to 1738. Plan to show line.

Wellington street. — Columbus avenue to Carleton street. Plan and profile of edgestone for proposed grade.

West Concord street. — Washington street to Shawmut avenue. Plan and profile of edgestone for proposed grade.

Winchester street. — Ferdinand street to Church street. Plan and profile of edgestone for proposed grade.

SOUTH BOSTON.

Atlantic-avenue extension. — Fort Point channel to Foundry street. Plan and profile of proposed laying out and established grade.

B street. — Between Congress street and West First street. Plan and profile for proposed relocation, widening, extension and grade.

Covington street. — Between East Eighth street and Columbia road. Plan and profile of proposed laying out and grade.

Dorchester avenue. — Broadway to Fort Point channel. Plan and profile of edgestone for proposed grade.

East Third street. — Southeasterly corner G street. Plan for sidewalk assessment.

East Third street. — Between N and O streets. Plan of proposed grade.

East Fourth street. — Between H and I streets. Plan of proposed revised grade.

East Fifth street. — Northeasterly corner H street. Plan of school-house lot for grading.

East Fifth street. — No. 507. Plan for sidewalk assessment.

East Ninth street. — Between Dorchester street and Mercer street, southerly side. Plan of bath-house lot.

East Ninth street. — Between Dorchester street and Mercer street, southerly side. Plan for addition to bath-house lot.

Fargo street. — Between B street and Congress street. Plan and profile of proposed laying out and grade.

Foundry street. — Dorchester avenue to Broadway. Plan and profile of edgestone for proposed grade.

G street. — Southeasterly corner East Third street. Plan for sidewalk assessment.

I street. — East First street to bridge. Plan for proposed relocation.

Power street. — Dorchester avenue to Boston street. Plan and profile for revised grade.

Rawson street. — Dorchester avenue to Boston street. Plan and profile for revised grade.

Thomas park. — Plan showing addition to school lot, for Public Buildings Department.

Thomas park. — East end High School lot. Survey to locate old iron fence.

Vale street. — Between Dorchester street and Mercer street. Plan of proposed revised grade.

Washburn street. — Dorchester avenue to Boston street. Plan and profile for revised grade.

EAST BOSTON (INCLUDING BREED'S ISLAND).

Bennington street. — Prescott street to Revere line. Plan and profile of proposed widening, extension and grade.

Bremen street. — Brooks street to Putnam street. Plan and profile for revised grade of edgestone.

Chelsea street. — Marion street, Morris street and Paris street. Plan of City Paving Yard and City Sewer Yard, for Street Department, Paving Division.

Lewis street. — At Ferry. Plan for proposed widening.

Paris street. — Northwesterly side, between Gove street and Porter street. Plan of Gymnasium lot and building.

Pearl place. — From Public Alley No. 2001 to Brigham street. Plan and profile of proposed laying out and grade.

Public Alley No. 2001. — From Webster street to Marginal street. Plan and profile of proposed laying out and established grade.

Saratoga street. — Marion street and Princeton street. High School lot. Grade plan for Public Buildings Department.

CHARLESTOWN.

Alford street. — Main street to Malden bridge. Plan and profile of edgestone for proposed grade.

Hamblen street. — Arlington avenue to George street. Plan and profile of proposed laying out and grade.

Monument square. — Plan of proposed addition to school lot.

Perkins street. — Somerville line to B. &. M. R.R. Plan and profile of edgestone for proposed grade.

Roland street. — Somerville line to the B. & M. R.R. Plan and profile of proposed laying out and grade.

Summer street. — School street, Pearl street and Bartlett street. Grade plan of Warren School lot and proposed addition for Public Buildings Department.

ROXBURY.

Adams street. — Southeasterly side, Yeoman street to Orchard street. Plan and profile of edgestone for proposed grade.

Astor street. — From Massachusetts avenue to Hemenway street. Plan for assessment.

Bancroft street. — From Columbus avenue to West Walnut park. Plan and profile for proposed laying out and established grade.

Boylston street. — From Boylston road to Brookline avenue. Plan for assessment.

Bray street. — Washington street to Columbus avenue. Plan and profile for proposed laying out and established grade.

Brunswick street. — From Blue Hill avenue easterly. Plan and profile for proposed laying out and established grade.

Cabot street. — Plan of bath-house lot for Bath Department.

Comins terrace. — Plan of portion of Munroe-street School lot.

Coventry street. — Tremont street to Columbus avenue. Plan and profile for proposed laying out and established grade.

Cummington street. — Avon street to Blandford street. Plan and profile for proposed laying out and established grade.

Dunreath street. — From Aspen street to old end of street. Plan and profile for extension and established grade.

Ellingwood street. — From Lawn street, westerly. Plan and profile for proposed laying out and established grade.

Elm Hill avenue. — Northwesterly side Crawford street to Howland street. Plan and profile for proposed grade.

Ernst street. — W. Walnut park to Bragdon street. Plan and profile for proposed laying out and established grade.

Forrest and Vine streets. — Northeasterly corner. Plan and profile for building for Building Department.

Francis street. — Huntington avenue to Brookline avenue. Plan and profile for widening and established grade.

Harold street. — Walnut avenue to Munroe street. Plan for assessment.

Humboldt avenue. — Munroe street to Bower street. Plan and profile of edgestone for revised grade.

Ipswich street. — Boylston road to Boylston street. Plan for assessment.

Jersey street. — Brookline avenue to Audubon road. Plan and profile for proposed laying out and established grade.

Langdon street. — Shirley street to Norfolk avenue. Plan and profile for proposed laying out and established grade.

Lawn street. — Plan showing owners' names, and frontage of estates for Paving Division.

Miles street. — West Walnut park to Bragdon street. Plan and profile for proposed laying out and established grade.
Munroe street. — Plan of land added to school lot.
Norfolk avenue. — Between Magazine street and Gerard street. Plan and profile of edgestone for proposed grade.
Orchard park. — Plan of bath-house lot, for Bath Department.
Pontiac street. — Hillside street to Alleghany street. Plan and profile for proposed laying out and established grade.
Priesing place. — Day street to Creighton street. Plan and profile for proposed laying out and established grade.
Prentiss place. — Plan showing proposed change in lines.
Public Alley No. 901 — Off Hemenway street. Plan and profile for proposed laying out and established grade.
Public Alley No. 903. — Haviland street to Norway street. Plan and profile for proposed laying out and established grade.
Queensberry street. — Audubon road to Audubon road. Plan for assessment.
St. Stephen street. — Extension to Bryant street. Plan for assessment.
Shirley street. — Norfolk avenue to Massachusetts avenue. Plan and profile for proposed laying out and established grade.
Smith street. — Plan and elevation of St. Alphonsus Hall for Building Department.
Street No. 1049. — Off Heath street. Approximate profile for proposed grade.
Turner street. — Haviland street to Astor street. Plan for assessment.
Vine street. — Northeasterly corner Forest street. Plan and elevations of building for Building Department.
Webber street. — Harrison avenue to Albany street. Plan and profile of edgestone for proposed grade.
West Walnut park. — Amory street to Bancroft street. Plan and profile for proposed laying out and established grade.
Willow park. — Shawmut avenue to Westminster street. Plan and profile for proposed laying out and established grade.
Worthington street. — Longwood avenue to Fenway. Plan and profile for proposed laying out and established grade.
Yeoman street. — Hampden street to Adams street. Plan and profile of edgestone for proposed grade.

Dorchester.

Allbright court. — Plan for addition to engine-house lot.
Bailey street. — Plan for addition to school lot.
Barrington street. — From Bowdoin street to Homes avenue. Plan for construction assessment.
Bernard street. — From Harvard street to Talbot avenue. Plan for construction assessment.
Boston street. — From Mt. Vernon street to Edward Everett square. Plan and profile for widening.

Burt street. — From Ashmont street to Washington street. Plan for construction assessment.

Carlisle street. — From Centre street to Welles avenue. Plan and profile for proposed laying out and established grade.

Carlos street. — Plan for construction assessment.

Carson street. — Plan and profile for revised grade.

Chamblet street. — From Hartford street to Magnolia street. Plan for construction assessment.

Chapman avenue. — Plan and profile for proposed laying out and established grade.

Clinton street. — From Waterlow street to Faxon street. Plan and profile for proposed laying out and established grade.

Columbia road. — From Stanwood street to Brunswick street. Plan showing portion of estate remaining after the laying out of Columbia road.

Devon street. — From Blue Hill avenue to Columbia road. Plan and profile for proposed laying out and established grade.

Draper street. — From Bowdoin street to Robinson street. Plan and profile of laying out and established grade.

Edwin street. — Plan and profile for revising grade, from Dorchester avenue to Shawmut park.

Fairmount street. — From Washington street to Morton street. Plan for construction assessment.

Harvard avenue. — From Harvard street to Washington street. Plan and profile for proposed laying out and established grade.

Harrison street. — From Greenhill street to Preston street. Plan and profile for laying out and established grade.

Idaho street. — From Manchester street to River street. Plan for construction assessment.

Johnson terrace. — From Lauriat avenue to N.Y., N.H. & H. R.R. Plan and profile for revising grade.

Kilton street. — From Harvard street to Talbot avenue. Plan and profile for laying out and established grade.

Lauriat street. — From Lauriat avenue to Ballou avenue. Plan and profile for revising grade.

Lauriat avenue. — From Norfolk street to Tucker street. Plan and profile for laying out and established grade.

Leroy street. — From Geneva avenue to Ditson street. Plan for construction assessment.

Leedsville street. — From Adams street to Dorchester avenue. Plan for construction assessment.

Lonsdale street. — Plan for construction assessment.

Maryland street. — From Bay street to Savin Hill avenue. Plan for construction assessment.

Melbourne street. — From Centre street to Welles avenue. Plan and profile for laying out and established grade.

Millet street. — From Talbot avenue to Wheatland avenue. Plan and profile for laying out and established grade.

Milton avenue. — From Lauriat avenue to Norfolk street. Pla and profile for revising grade.

Morton street. — From West Selden street to the N. E. R.R. Plan for relocation.

Moseley avenue. — From Columbia road to Crescent avenue. Plan and profile for laying out and established grade.

Nightingale street. — From Bernard street to Talbot avenue. Plan for construction assessment.

Norton street. — From Bowdoin avenue to Homes avenue. Plan and profile for laying out and established grade.

Nottingham street. — From Bullard street to Rosseter street. Plan and profile for laying out and established grade.

Oakley street. — From Bowdoin street to Geneva avenue. Plan for construction assessment.

Perth street. — From Phipps avenue to Quincy street. Plan and profile for laying out and established grade.

Perth street. — Between Phipps avenue and Quincy street. Plan for school lot on westerly side.

Peverell street. — From Salcombe street to Sawyer avenue. Plan for construction assessment.

Rosseter street. — From Nottingham street to Bullard street. Plan for construction assessment.

Samoset street. — From Centre street to Welles avenue. Plan and profile for laying out and established grade.

School street. — At Athelwold street. Plan of proposed widening.

School street. — Plan for addition to school lot.

Shawmut park. — From King street to Templeton street. Plan and profile for laying out and established grade.

Shepton street. — From Shawmut park to Dorchester avenue. Plan and profile for laying out and established grade.

Stonehurst street. — From Barrington street to Bowdoin street. Plan and profile for laying out and established grade.

Talbot avenue. — From Bernard street to Kilton street. Plan and profile for revising grade.

Thane street. — From School street to Harvard street. Plan and profile for laying out and established grade.

Thane street. — From Athelwold street to School street. Plan and profile for laying out and established grade.

Tucker street. — From Lauriat avenue to Callender street. Plan and profile for revising grade.

Van Winkle street. — Plan and profile for crossing railroad.

Vaughan street. — From Blue Hill avenue to Harvard street. Plan and profile for laying out and established grade.

Waldeck street. — From Park street to Geneva avenue. Plan and profile for laying out and established grade.

Waldeck street. — From Melville avenue to Tonawanda street. Plan and profile for laying out and established grade.

Waldeck street. — From Melville avenue to Park street. Plan and profile for laying out and established grade.

Warner avenue. — From Harvard street to Talbot avenue. Plan and profile for laying out and established grade.

Washington street. — From Codman street to Fairmount avenue. Relocation. Plan and profile for laying out and established grade.

Waterlow street. — From Harvard street to Harvard street. Plan for construction assessment.

Westcott street. — From Park street to Talbot avenue. Plan and profile for revising grade.

West Selden street. — Plan for construction assessment.

Whitfield street. — From Talbot avenue to Wheatland avenue. Plan and profile for laying out and established grade.

Woodcliff street. — From Howard avenue. Plan and profile for laying out and established grade.

WEST ROXBURY.

Angell street. — From Blue Hill avenue to Canterbury street. Plan and profile of proposed laying out and established grade.

Baker street. — Northwest corner of Gardner street. Plan showing levels on school lot for Architect.

Belgrade avenue. — From Malcolm street to Beech street. Plan and profile of proposed laying out and established grade.

Belmore terrace. — From Boylston street to Boylston terrace. Plan for construction assessment.

Bourne street. — From Walk Hill street to Patten street. Profile for grade.

Boylston street. — From Adelaide street to Nelson street. Profile for grade.

Carolina avenue. — Plan and profile of proposed widening and established grade and extension to Williams street.

Centre street. — Near La Grange street. Plan of old cemetery for Cemetery Commission.

Clifton street. — From Kittredge street to Norfolk street. Plan and profile of proposed laying out and established grade.

Congreve street. — From South street to Centre street. Plan and profile of proposed laying out and established grade.

Corinth street. — From Washington street to Brandon street. Plan and profile of proposed widening and established grade.

Elgin street. — From Centre street to West Roxbury Branch of the N. Y., N. H. & H. R.R. Plan and profile of proposed laying out and established grade.

Gardner street. — From Baker street, 1,100 feet westerly. Plan and profile for revising grade.

Hillcrest street. — From Elgin street to Lorette street. Plan and profile of proposed laying out and established grade.

Hyde Park avenue. — From Patten street to Eldredge road. Profile for grade.

Lorette street. — From Centre street to the West Roxbury Branch of the N. Y., N. H. & H. R.R. Plan and profile of proposed laying out and established grade.

Lorraine street. — From Colberg street to Belgrade avenue. Plan and profile of proposed laying out and established grade.

Perkins street. — From Day street to Jamaicaway. Plan and profile of proposed widening and established grade.

Railroad street. — From Willow street to Corey street. Plan and profile of proposed laying out and established grade.

Rowe street. — From Ashland street to Seymour street. Plan and profile of proposed laying out and established grade.

South street. — From Jamaica street to Arborway. Plan and profile of proposed relocation and established grade.

South street. — At Roslindale station. Plan of subway under West Roxbury Branch of N. Y., N. H. & H. R.R.

Spalding street. — From South street to N. Y., N. H. & H. R.R. Plan and profile of proposed laying out and established grade.

Spring street. — At Charles river. Plan showing trees, water line and levels for Architect's Division.

Wachusett street. — From Walk Hill street southerly, to beyond Eldredge road. Plan and profile of proposed laying out and established grade.

Walter street. — Near Mendum street. Plan of old cemetery for Cemetery Commission.

Walk Hill street. — At Wachusett street. Profile for grade.

Walk Hill street. — Washington street to Hyde Park avenue. Profile for grade.

Washington street. — From Hyde Park avenue to Walk Hill street. Profile for grade.

Willow street. — From Centre street to Railroad street. Plan and profile for proposed laying out and established grade.

Woodlawn street. — From Hyde Park avenue to Forest Hills Cemetery. Plan for construction assessment.

BRIGHTON.

Brackett street. — From Washington street to Faneuil street. Plan and profile for proposed laying out and established grade.

Chester street. — From Brighton avenue to Commonwealth avenue. Plan and profile for proposed laying out and established grade.

Chiswick road. — From Englewood avenue to Chestnut Hill avenue. Plan for construction assessment.

Commonwealth avenue. — From Warren street to Chestnut Hill avenue. Plan and profile showing revised grade.

Essex street. — From Commonwealth avenue to and across Charles river into Cambridge. Plan and profile for roadway.

Malvern street. — From Brighton avenue to Ashford street. Plan for construction assessment.

North Beacon street. — At B. & A. R.R. bridge. Plan and profile to show established grade.

North Harvard street. — Between Charles river and Western avenue. Plan and profile of proposed widening, relocation and established grade.

North Harvard street. — Willard place to and across Charles river into Cambridge. Plan and profile of roadway.

Orkney road. — From Strathmore road to Sutherland road. Plan and profile of proposed laying out and established grade.

Strathmore road. — From Chestnut Hill avenue to the Brookline line. Plan for construction assessment.

Webster street. — Plan of old school lot, showing levels and proposed widenings, for Architect.

APPENDIX D.

LIST OF STREETS WHERE LOT FRONTAGES HAVE BEEN OBTAINED FOR THE SEWER DIVISION OF THE STREET DEPARTMENT FOR SEWER ASSESSMENTS FROM JANUARY 1, 1898, TO FEBRUARY 1, 1899.

Boston Proper.

Allen street. — Brighton street to Charles street, north side.
Atlantic avenue. — East side, T wharf to Commercial wharf.
Barton street. — Chambers street to Milton street.
Boylston street. — From near Massachusetts avenue to Bothnia street.
Central street. —
Charles street. — Allen street to Poplar street.
Commercial street. — From North Market street to Clinton street.
Tremont street. — Corning street to bridge.
Warren avenue. — Clarendon street to Dartmouth street.
Washington street. — Oak street to Pine street.
Wiget street. —

South Boston.

B street. — Between West Broadway and West Seventh street.
Covington street. — Between Thomas park and East Eighth street.
Dorchester avenue. — Between West Seventh street and D street.
Dorchester street. — Between West Second street and Emerson street.
Dorr street. — Between Dorchester avenue and Ames street.
East First street. — Between N street and O street.
East Fourth street. — Between I street and Jay street.
H street. — Between East Eighth street and Columbia road.
Tudor street. — Between F street and Dorchester street.

East Boston (including Breed's Island).

Ashley avenue. — From Breed street to Bennington street.
Bremen street. — From No. 288 to Putnam street.
Chelsea street. — From Curtis street to Chelsea creek.
Falcon street. — From Meridian street to Border street.

Frankfort street. — From Maverick street to Decatur street.
Marginal street extension. —
Saratoga street. — From Washburn street to Austin avenue.
Sumner street. — From Nos. 391 and 402 to Samson street.
Wordsworth street. — From Pope street to Saratoga street.

CHARLESTOWN.

Roland street. —From Crafts street to Somerville line.
Russell street. — From Mead street to Eden street.
Rutherford avenue. — From Chapman street to Dunstable street.

ROXBURY.

Bryant street. — Between Huntington avenue and Hemenway street.
Columbus avenue. — Between Centre street and Bragdon street.
Columbus avenue. — Between Roxbury street and New Heath street.
East Lenox street. — Between Reed street and Fellows street.
Eldoro street. — From Hillside street to angle.
Ellingwood street. —
Fellows court. — Off Fellows street.
Harrison avenue. — Between Massachusetts avenue and Eustis street.
Hunneman street. — Between Harrison avenue and Fellows street.
Hutchins avenue. — Between Day street and Grotto glen.
Mozart street. — Between Centre street and Armstrong street.
Norway street. — Between Parker street and Turner street.
Parker Hill avenue. — Between Parker street and Calumet street.
Parker street. — Between Norway street and Westland avenue.
Peterborough street. —
Ruggles street. — Between Parker street and Huntington avenue.
Turner street. — Between Haviland street and Astor street.
Vancouver street. — Between Ward street and Ruggles street.
Wabeno street. — Between Wyoming street and Wabon street.
Walnut avenue. — Between Rockland street and Leslie park.
Walpole street. — Between Tremont street and Columbus avenue.

APPENDIX E.

ENGINEERING DEPARTMENT PROPERTY SCHEDULE, MAIN OFFICE.

1 horse.
2 carriages.
1 sleigh.
2 harnesses.
3 robes.
Instruments for drawing.
Instruments for surveying, as follows:
1 Temple transit.
5 Buff & Berger transits.
8 Gurley transits.
1 Stackpole transit.
2 Temple levels.
4 Buff & Berger levels.
5 Gurley levels.
11 Boston rods.
3 New York rods.
4 Troy rods.
Cases for plans and books.
Reference Library, 1,216 volumes.
11,181 Plans Engineering Works, loose.
14 volumes Plans Engineering Works, bound.
Photographs of Engineering Works.
Apparatus for blue printing.
1 microscope.
1 mercurial barometer.
1 aneroid barometer.
1 holosteric barometer.
1 set hydrometers.
1 hygrometer.
1 pair field glasses.
2 typewriters.
2 dynamometers.
1 pentagraph.
1 calculating-machine.
1 volt meter.
1 comptometer.
2 thermophones.
1 camera.
1 planimeter.
1 Bourdon pressure gauge.

SURVEYING DIVISION.

3 Temple transits.
2 Moody transits.
2 Buff & Berger transits.
3 Stackpole transits.
1 Troughton & Sims transit.
1 Poole transit.
1 Archibut transit.
1 King transit.
7 Buff & Berger levels.
1 Moody level.
2 Temple levels.
1 Ewing level.
1 Gurley level.
17 Boston rods.
1 New York rod.
6 pipe rods.
28,754 plans.
4,536 lithographed maps.

ARCHITECTURAL DIVISION.

1 horse.
1 Goddard buggy.
1 Open buggy.
1 sleigh, harnesses, robes, stable blankets, etc.
1 Remington typewriter.
Miscellaneous drawing instruments.
600 plans in filing cases in storeroom.

APPENDIX F.

Elevations referred to Boston City base. (The city base is 0.64 feet below mean low tide.)

Feet.	
0.00	City base.
15.66	Highest tide, April 16, 1851.
15.33	Coping on dry dock, Charlestown Navy Yard.
14.75	Elevation of tide November 27, 1898.
12.04	Greatest elevation of high tide, per United States Tide Tables, November 17, 1899 (11.4 + 0.64) = 12.04.
8.14	Least elevation of high tide, per United States Tide Tables, March 20 and April 18, 1899 (7.5 + 0.64) = 8.14.
2.74	Greatest elevation of low tide, per United States Tide Tables, April 19, 1899 (2.1 + 0.64) = 2.74.
— 1.06	Least elevation of low tide, per United States Tide Tables October 19, 1899 (— 1.7 + 0.64) = — 1.06.
0.64	Mean low tide.
5.00	Piles cut off for building.
9.91	Water works base (approximate tide-marsh level).
— 4.98	Cambridge City base.
0.38	South Boston flats base.

NOTE. — Cambridge city base is 4.98 feet below Boston city base. The greatest elevation of high tide during the past year was on November 27, 1898; the grade of the tide on that date being 14.75 feet above city base.

APPENDIX G.

ENGINEERING DEPARTMENT ANNUAL REPORTS, 1867–1898.

No. of Reports.	For the Year.	Year Published and No. City Document.	No. of Reports.	For the Year.	Year Published and No. City Document.
First	1867	1868—22	Twentieth	*1886	1887—38
Second and Third	1868–69	1870—14	Twenty-first	1887	1888—39
Fourth	1870	1871—15	Special report	1888	1888—117
Fifth and Sixth	*1871–72	1873—23	Twenty-second	1888	1889—38
Seventh	*1873	1874—20	Twenty-third	1889	1890—39
Eighth	1874	1875—19	Twenty-fourth	*1890	Executive Department Report, Document 1, Part I. 1891.
Ninth	1875	1876—24			
Tenth	*1876	1877—15			
Eleventh	*1877	1878—20	Twenty-fifth	1891	1892—11
Twelfth	*1878	1879—22	Twenty-sixth	1892	1893—10
Thirteenth	*1879	1880—33	Twenty-seventh	1893	1894—10
Fourteenth	*1880	1881—25	Twenty-eighth	1894	1895—10
Fifteenth	1881	1882—52	Twenty-ninth	1895	1896—10
Sixteenth	1882	1883—53	Thirtieth	1896	1897—10
Seventeenth	*1883	1884—55	Thirty-first	1897	1898—12
Eighteenth	*1884	1885—54	Thirty-second	1898	1899—12
Nineteenth	*1885	1886—41			

* Out of print.

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